The New England
Journal of Medicine

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VOLUME 221 JULY 20, 1939 NUMBER 3

MASSACHUSETTS MEDICAL SOCIETY

THE MASSACHUSETTS MEDICAL SOCIETY AND SOCIALIZED MEDICINE*

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BOSTON

EACH member of the Massachusetts Medical Society is a unit in medicine and each doctor has been a unit in social medicine from the days of Hippocrates. Intertwined with his zeal to heal the body he has had "the desire for removing human error, clearing human confusion and diminishing human misery." But today individuals are apt to count for too little and the public looks to groups or to the state itself for guidance. So in medicine it either pays little attention to the single doctor or overrates him, while it stares at the armies of organized medicine in the United States, the medical societies and the medical schools. I, for one, believe in the unit, believe in the individual, love his initiative, admire his competitive spirit and above all trust his conscience, though I am not unmindful of the demand of the public that we as a profession exemplify in our societies and in our medical schools by measures and acts our highest aspirations, and I hope we shall not be judged by our ofttimes pitiful performances. There is no gainsaying the necessity for our societies and our schools to be as jealous of their reputations as we as individuals are of our own.

This need for the medical society and the medical school to express convictions and give advice is all the stronger because a generation ago the influence of the doctor as a unit in social medicine was far greater than it is today. This was largely because at that time the number of educated men in the community was so much smaller and the standing of the lawyer, the minister and the doctor carried more weight. Their opinions were sought more, and each one dealt more intimately with the social problems of his circle than did representatives of other groups. It is natural that with the expansion of education among all classes, the influence of the doctor in molding society and determining its action has decreased. Former President Lowell has often deplored this fact and urged doctors to take a far more active interest in civic affairs, and in this we will all agree, but besides this we must see to it that our groups of doctors in their medical gatherings do so too, and by their enlightened action demonstrate their altruism and their desire for the common good. If we doctors do not have as much influence among our fellows as a century ago, it is to some degree our own fault because we have become too much engrossed in our own individual medical lives. It is not strange that our medical societies and schools have been far too much concerned with purely technical medical problems, because these have become so manifold with the rapid development of medicine.

Each member of the Massachusetts Medical Society who, like Dr. Homer Gage or Dr. George Sears, takes up hard, trying and often thankless tasks for his city not only deserves our constant admiration, but serves as a stimulus for the rest of us in lesser ways and in smaller environments to exert an influence for good. These have made the public aware how earnest and self-sacrificing doctors can be, just as the work of the Massachusetts Department of Public Health is a constant reminder of the purpose of our state to safeguard the health of its citizens. More duties are constantly being placed upon the department so that perhaps at this moment it is more active in promoting sound medicine than ever before.

Thus far you perceive that I have been talking about social medicine, and in so doing I stand on solid ground. I much prefer this term, "social," to that of "socialized medicine," which I think few of us want and most of us hope through the ad-

*The Annual Discourse delivered at the annual meeting of the Massachusetts Medical Society, Worcester, June 8, 1939.

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vancement of social medicine can be deferred and time thereby allowed for a revision of methods proposed, which if promulgated today might engulf us.

It is difficult to estimate the individual doctor's efforts in social medicine, and I doubt the desirability of doing so. Although your committee finds that a single doctor probably treats nearly a hundred patients a year without any financial return, and if working in a hospital, many hundreds, consuming six to ten hours a week in the process, it is a question in my mind if he may not do more and actually better social medicine when he treats his other patients either at reduced cost, enabling them to save their self-respect, or even the remainder at full rates. You cannot measure a doctor's social value by what he does for the poor alone. He may exercise a far higher type of social medicine when he raises the morale of a capable but discouraged manufacturer or salvages both the soul and body of a millionaire. The survey of the committee on the number needing medical care appears to show that those unable to secure it in this state is really very small indeed.

Health Councils

Certain units of our medical society several years ago took a strong stand in favoring the creation of health councils. In these were represented all those agencies which were concerned in the health, and often charitable, activities of a given community. As an example I may cite the Massachusetts Central Health Council. Obviously any association which brings together all societies working in any way toward health is an advantage, because it promotes efficiency and reduces cost. Already in Springfield such a council has been established under the name of the Health Promotion Council of Springfield, and still another on Cape Cod under the designation of the Cape Cod Council of Health and Social Agencies. The Massachusetts Central Health Council represents eighteen different organizations, and some of these are made up of many constituent parts. This Massachusetts Central Health Council has cooperated closely with the Massachusetts Medical Society in its efforts to raise medical standards and guide legislation along progressive and sensible lines.

Our fellow member, Dr. Michael A. Tighe, in a radio broadcast on December 14, 1938, set forth very strongly the benefits which accrue from the organization of a health council. He brought out not only the desirability but the necessity for such councils, and touched upon many of the problems in which our members should take a more active interest. This endeavor to promote the improvement of sanitation and health, housing, nursing and medical care of the poor of a town, a city or a county requires more than the work of an individual; it requires the laborious, united and unremitting endeavor of groups of individuals and societies. Doctors, by actively taking part in all such agencies seeking the betterment of health, may demonstrate their availability and willingness to co-operate. Their experience and wisdom, so necessary in the plain everyday details of relief work, whether medical or otherwise, will become known and appreciated if they enter wholeheartedly into the work of all charitable societies. Only by joining in such work can one learn and be able to point out how present facilities can be more wisely used. Incidentally, in this manner the doctor will learn on a large scale, what his clientele has taught him on a small scale, the social as well as the medical wants of the indigent, and so he can drive home the idea that just as food, clothing and housing are contributed to the needy, medical aid should be provided as well, and not wholly as a matter of charity by the doctor. By utilizing these forums of the health councils, established in communities throughout the State, members of our society can emphasize that there is not so much a lack of medical facilities as there is the need, as Dr. Tighe says, for their better distribution.

It is unfortunate that more of these health councils have not been organized. Only those who have participated in their meetings can fully understand the good which they do. Unquestionably they are composed of our friends, but sometimes even our friends have not understood completely the desires of doctors, either individually or collectively, to improve medicine, simply because we doctors may object to some special measure which, although perhaps good in itself, we believe to be impractical for execution at the moment.

Associated Hospital Service Corporation

The avidity with which the public has taken advantage of the provisions of the hospital-service corporations is a good index of the kind of socialized medicine which the people want. This type of organization is still in its infancy but in the United States during the last few years the membership has grown so rapidly that 3,500,000 individuals were enrolled on April 1, 1939. The Massachusetts unit is the fourth in size in the country and by the first of May this year the enrollment totaled 181,881 individuals. When more than 3,000,000 of the citizens in this country take up a project of this kind so quickly, it is self-evident that it has filled a need. In consequence we may anticipate

that it, or a modification of it, will be adopted by many more millions. That the organization has been developed as a private agency instead of a public undertaking and is not political is all the more in its favor. That there is interest enough in the plan to have aroused a desire for hospital insurance at ward rates as well as for semi-private accommodations should encourage everyone, because this is evidence that an increasing number of our population wish to be independent and self-supporting. Nothing has heartened me more in the work at camps for diabetic children than the wish of the parents to bear a portion of the costs. People do not like to be on the dole or on anything which suggests it. I am sure all of us are eager for the Associated Hospital Service Corporation to extend itself.

By no means can the medical profession claim all the credit for the good this organization is doing, but fortunately the medical profession has shared in its activities. Not the least of the many benefits from this new trend in medicine is the opportunity which this organization has presented to study on a relatively small scale what is likely to happen if similar facilities on a large scale should be offered the public. At first it appeared as if the corporation's assets were accumulating too rapidly, and then the trustees extended the benefits of membership. It is perhaps fortunate this spring that the reverse became true, and I know of nothing which will lead to more careful and sober thought about the extension of benefits conferred by medical-service organizations than the fact that it has been necessary to defer hospital payments 25 per cent in New York City and 20 per cent here in Massachusetts. So great had been the surplus early in the year that an extension of services was arranged so that payments originally covering actual hospital cost were increased to include costs for x-ray as well. I am sorry that the hospitals concerned were not consulted before this decision was reached. When we remember that the trustees, who are in charge of the organization here and of similar organizations elsewhere, are citizens of the highest type and wide experience, and yet that the possibilities of deficit were not adequately foreseen, it proves to each one of us the necessity for careful deliberation before extending the scope of any plans for the simplification of medical care. The Associated Hospital Service Corporation has the good wishes of us all. We know that its directors are exercising their best judgment. If the plan runs into pitfalls, as it did this spring when colds became more prevalent and people sought to get back their money's worth by a good rest in a hospital, that is all the more to the good, because it teaches us how easily funds are exhausted. When such a scheme temporarily fails, moreover, we realize that any deficit must be borne by the doctors and nurses and hospital employees, rather than by those who execute the undertaking.

Prepayment of Medical Care

It is only a step from the socialized — and this time not social — Associated Hospital Service Corporation to an organization for the prepayment of physicians' services. How quickly we move! Who would have thought of that a decade ago? And how skeptically such a plan would have been regarded! Yet after deliberations occupying less than a year, the Massachusetts Medical Society stands committed to it. It has gone still farther and voted not only to take the initiative in it as soon as an enabling act is passed by the legislature, but also to organize a corporation to carry it into effect. Such speed is spectacular. How valuable it is for critical study that there are so many organizations — I understand there are 450 — throughout the United States which have in one way or another devised plans for the prepayment of doctors' fees. It is unfortunate that people generally are not better acquainted with these experimental efforts. Whether one or more organizations independently or in conjunction with the Massachusetts Medical Society will form corporations to take part in such prepayment plans is not essential. Possibly it might be better to have several undertake such activities, because each could profit from the mistakes or successes of the others. Furthermore, the members of each group might have had earlier experience in such undertakings based on contacts of a social, religious or professional nature. Again, just as in the case of the hospital service plan, one of the chief advantages of multiple prepayment medical service plans may be that they will furnish information which later might be of service to governmental units, large or small, when dealing with the care of the sick poor. The more errors we can discover on a small scale, the less catastrophes there will be on a large one.

The Wagner Act

In any discussion of socialized medicine before the Massachusetts Medical Society the Wagner Act must be mentioned. Few if any of us would approve of it in its entirety, and I think I voice the opinion of most of you when I say that the Society would like it to gestate in committee a long time. I suspect that you and I are opposed to it as it stands, first, because we as a society and as individuals are opposed to going into debt, and therefore cannot approve of the expenditure

of nearly $100,000,000 the first year and approaching $1,000,000,000 a few years hence. Second, a nation that is in debt, like the individual, is subservient to someone else. We do not wish to be subservient to anyone, even to our government. We wish our independence. Third, the health of the people in the United States is so much better than that in other regions of the world, except in certain small nations, that no radical revision of health measures should be attempted which disregards and discards those which have already yielded so many benefits.

It may be claimed that we have more wealth and more natural resources than other countries, and that these facts and not our present medical customs are responsible for the health of our people, but that is our good fortune. It is surely true that our health is improving by leaps and bounds under our present conditions. I have studied one disease thoroughly and have seen it for myself in various countries, and I know, so far as that disease is concerned, that the United States can challenge the world. I am not aware of any area anywhere where the average of medical care of diabetic patients is better than in Massachusetts. As proof I can say that the new patients consulting me this year have already had the disease longer than their total life span twenty-five years ago. The illnesses which we encounter in those classes of the community and that stratum of society where the health is poorest are by no means wholly due to poor medical care or to poor doctors, but rather to unemployment, for which the doctors are not responsible. When business is good in this country, there is comparatively little complaint about poor health or inadequate medical care.

Fourth, even if one grants that socialized medicine, as we understand the term, is desirable, to extend it at one stroke to 40,000,000 people in the United States is dangerous, because we have not the medical personnel sufficiently trained to do the actual work, much less to supervise it. This danger is best foreseen by those who are most competent to judge, namely those who are actively concerned on the firing line in health work. The number of doctors in the United States Public Health Service was 2212 on April 8, 1939. There were 6230 other employees and 4823 doctors connected with state and county health departments holding appointments in the United States Public Health Service with nominal compensation at the rate of $1 per annum. One is appalled at the thought of the appointment of doctors by the Government sufficient to raise the number to 40,000 because at present competent doctors for the task have not been trained. Expansion of the work for the care of the sick must proceed slowly, especially if it is to be along lines which are entirely different from those which have been utilized in the immediate past.

Fifth, politics already play a part in health matters. Although recruits for important posts are available from the United States Public Health Service, they are passed over. I fear to turn 40,000 appointments into politics until the community as a whole has so emphatically expressed itself that politicians will not dare to tamper with the health of the people. If the army of 40,000 appointees came under the central authority at Washington or even at state capitals, think of the control which might be exercised through these political appointees on the 40,000,000 people for whom they would care! The political interference with the minor policies of the Boston City Hospital is an illustration of the petty politics which can make it so disagreeable to assume public office as to deter many able men from accepting positions of responsibility. On the whole, though, I am under the impression that the public sees through this campaign of innuendo and condemns it more today than it would have done a few years ago.

If we could expand the United States Public Health Service gradually, I venture to say that much of the opposition to a rearrangement of the care of the indigent sick would melt away, because both doctors and the laity would have time to note the advantages and remedy the shortcomings of this metamorphosis of medicine.

Sixth, we are not satisfied with the present setup for the WPA or Social Security agencies, and it is conceded that changes should be made in the original acts. Why not attempt to perfect these huge departments of the Government before inaugurating a nation-wide health program soon to involve a billion dollars? Let us profit from failures in similar projects. There is no harm in a little delay, because the health of the country will be improving in the meantime. Here in Massachusetts beds for tuberculosis are beginning to be empty, and there is a diminishing cancer waiting list at our state hospitals.

Seventh, the allocation of medical funds causes apprehension. We fear that to certain states with relatively good health conditions — and these are particularly those states which furnish high revenues to the Government — where four dollars more or less are now appropriated per capita for health the allotment might be reduced to forty cents or thereabouts; and to those states expending forty cents per capita, four dollars might be assigned. Perhaps we should be so altruistic as to forget this possibility. Nevertheless we do not want to give a prize of four dollars a head to that state which

shows it takes the poorest care of the health of its citizens.

Eighth, to institute an enormous hospital building program is disturbing and its advisability is questionable. Hospitals of a voluntary nature and also those of a public nature are increasing with astounding rapidity. It is reported that in 1938 the equivalent of a 101-bed hospital was erected each day in the year throughout the country. Yet at times nearly 30 per cent of the beds in voluntary hospitals are vacant. I am sure that all of us feel that available hospitals should be utilized before new hospitals are built. Arizona may need 1000 new beds for tuberculosis, but would it not be cheaper to utilize the 500 vacant beds for tuberculosis in Colorado for this purpose than to build sanatoriums for a disease which is diminishing at the rate of 5 to 10 per cent a year throughout the whole country? In Arizona the mortality rate from tuberculosis in 1925–1927 was 366.0 per 100,000, but it dropped 27.3 per cent or to 266.2 in 1935–1937. In 1938 the rate (provisional) from tuberculosis was 178.8 per 100,000.

Everyone agrees that medicine can improve now and forever, but let us look before we leap and not by mistakes undo the good that has been done. I hope our Washington friends will not hurry us doctors. If they will give us a little time, we shall save their constituents money and produce better medicine, and most of it at our own expense.

Education, Postgraduate and Undergraduate, in Massachusetts

The education of the doctor represents the highest type of socialized medicine which the Massachusetts Medical Society can foster. Upon the Society rests a distinct responsibility in this regard, because of the 7528 doctors in Massachusetts there are 5109 who belong to our organization. In other words, our members are directly responsible for the health of more than two thirds of the people in the State, and it is up to us to see not only that we take care of these people well, but that we throw our influence toward good care for the remaining third of the population. If it is the duty of one of our members to take an active interest in the medical affairs of the people in his immediate environment, it is equally important for our society, representing all its members, to take a strong stand for the improvement of conditions in the State as a whole. Education is a business in Massachusetts. Those outside the State realize that education is one of our chief undertakings; yet when it comes to education in medicine there are very few states in the Union which recognize those licensed by our board as fitted to practice within their borders. All will admit that such a condition is intolerable. Little is said about it, but I think the time has come to air the question openly.

Postgraduate Education

First of all I shall discuss the postgraduate education of the physician. This amounts to far more than the laity, the medical schools or we, as doctors, have begun to realize. A few days ago in St. Louis I learned that of eight questions propounded in one examination to a candidate for qualification as an internist, there was but one which could be answered by what he had learned during his four years in a Class A medical school. One of the chief functions of a medical school today, therefore, must be to warn its students that their education has just begun, and to show them how they can most easily and advantageously continue it.

We can be justifiably proud of the advances which have been made in the last five years, and indeed this very year, in Massachusetts. The New England Postgraduate Assembly held in Cambridge last fall attests the eagerness of our members for knowledge. As a Harvard Medical School graduate I am proud that Harvard University gave us Sanders Theater for the purpose. This year the two days of instruction should be even better, and I know that your committee is gathering ideas from neighboring states regarding the possibility of expanding this teaching into institutes along specialized lines continuing for some months of the year.

Look at the excellence of the postgraduate courses given this winter and spring in eight districts of the Massachusetts Medical Society close to the offices of the doctors participating. The subjects were: anemia, Bright's disease and hypertension, heart disease, gonorrhea, syphilis, obstetrics and pediatrics. These courses and the attendance at them refute any idea that the doctors in Massachusetts after their graduation are backward.

Team play characterized the organization of these extension courses. The Massachusetts Medical Society, in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, united in effort. This represents socialized medicine at its best. But here I wish to state what I have been told authoritatively, that the above program was made possible largely through the help of the Massachusetts Department of Public Health, and that it

was furthered wholeheartedly and actively by the present health commissioner, Dr. Jakmauh, and if we doctors want still more postgraduate instruction, I am confident we shall find the commissioner anxious not only to assist in the program but to secure the funds.

But do you realize that this official postgraduate instruction is not half the story of postgraduate teaching in this state? There is much of what would be called in academic circles extracurricular teaching. Hospital units are giving not only their own courses to the doctors on their staffs and neighboring doctors, all of whom are welcome, but also courses which are all the more valuable because they are open to the laity, and thus the whole level of medical knowledge is being raised. These are, in large part, outgrowths of the Sunday lectures to the laity at the Harvard Medical School and Dr. Henry Christian's clinics to doctors at the Peter Bent Brigham Hospital. It will not take long for the people themselves to learn how important it is to have up-to-the-minute physicians and surgeons. Students, Dr. Keen long ago pointed out, yelp at the heels of their teachers, but now the public is barking at the heels of us old practitioners.

The reason why Massachusetts has the distinction of a falling cancer death rate, so I am informed by those who know most about it, is explained by the instruction given to doctors and by them to the laity through the aid of our society and organized under the direction of Dr. Herbert Lombard, in charge of the Division of Adult Hygiene of the Massachusetts Department of Public Health. Just as Dr. Vaughn in Detroit has enlisted practicing doctors as his allies, so here you have been enlisted and in fact have become auxiliary health officers of Massachusetts. Please note that you are doing this without appointment or recompense from Washington!

Undergraduate Instruction

Our methods of postgraduate medical instruction place us in an enviable position, but what can be said of undergraduate medical instruction in Massachusetts? As an introduction to this discussion let us first of all consider how many yearly replacements are necessary in order to maintain the present number of doctors in Massachusetts. Granted we have doctors enough, how many additions are required to maintain the existing 7528 doctors? Let us assume that physicians begin the actual practice of their profession at the age of twenty-seven. The life expectancy of men in the general population at this age is forty years and of physicians it is essentially the same. This must be about right, because the average age at death of 3768 doctors in the United States for 1938 was 65.6 years and that would limit them to thirty-eight years of practice. But this estimate is far too high, in my opinion, because so many give up medicine, retire or follow other careers long before this age is reached. As a safer criterion for the determination of the number of yearly additions to the medical profession in Massachusetts I have adopted another method. In the year 1909 the number of graduates joining the 134,402 doctors then in practice in the entire United States was 7246, a ratio of 1:19. At that rate the replacement would be complete in nineteen years. In 1938 the replacement ratio was almost the same, 1:18—9527 to 169,628. Since these ratios are so constant we might assume on this basis that doctors practice on the average about twenty years, and therefore here in Massachusetts we should need 376 additions to our numbers every twelve months in order to maintain our quota. Where shall we secure these 376 doctors?

This leads to the question, Where have Massachusetts doctors secured their medical education? In the *American Medical Directory* for 1938 are the names of 7528 physicians in Massachusetts. Table 1 shows that they received their medical training in 193* schools. Harvard supplied the most with 1816 names, closely followed by Tufts with 1704; next came Boston University with 598, followed by Middlesex with 232. The College of Physicians and Surgeons of Boston had 151. The University of Vermont had 189 graduates in the list and Yale had 73, or a scant 1 per cent of the total number.

TABLE 1. *Sources of Education of Doctors Practicing in Massachusetts.*†

MASSACHUSETTS	
Harvard University	1816
Tufts College	1704
Boston University	598
Middlesex University	232
College of Physicians and Surgeons	151
ARKANSAS	
University of Arkansas	1
CALIFORNIA	
Cooper Medical College	2
University of California	9
Stanford University	4
College of Medical Evangelists	11
COLORADO	
University of Colorado	12
CONNECTICUT	
Yale University	73
DISTRICT OF COLUMBIA	
George Washington University	21
Georgetown University	75
Howard University	6

*This does not include 542 graduates of institutions not listed as medical schools by the American Medical Association, and 51 whom the information received does not show that the physician graduated from a medical school.

†Existing approved schools are in italics.

GEORGIA

University of Georgia	3
Emory University	13
Georgia College of Eclectic Medicine and Surgery	1

ILLINOIS

University of Chicago (Rush Medical College)	31
University of Chicago	4
Hahnemann Medical College and Hospital	7
Bennett College of Eclectic Medicine and Surgery	2
Northwestern University Woman's Medical School	3
Chicago Homeopathic Medical College	1
Northwestern University	25
Illinois Medical College	1
University of Illinois	11
American Medical Missionary College	2
Chicago College of Medicine and Surgery	16
Chicago Medical School	3
Loyola University	7

INDIANA

Medical College of Indiana	1
Indiana Eclectic Medical College	1
Indiana University	17

IOWA

State University of Iowa	17
State University of Iowa College of Homeopathic Medicine	1
Drake University	4

KANSAS

University of Kansas	5

KENTUCKY

Kentucky School of Medicine	3
University of Louisville	8
Louisville Medical College	2
Kentucky University	2

LOUISIANA

Tulane University of Louisiana	15

MAINE

Bowdoin College	68

MARYLAND

University of Maryland	39
College of Physicians and Surgeons of Baltimore	56
Baltimore Medical College	101
Baltimore University	18
Woman's Medical College of Baltimore	4
Johns Hopkins University	98
Atlantic Medical College	1
Maryland Medical College	15
Maryland College of Eclectic Medicine and Surgery	4

MICHIGAN

University of Michigan	64
University of Michigan Homeopathic Medical School	6
Wayne University	4

MINNESOTA

University of Minnesota	12
Minneapolis College of Physicians and Surgeons	1
University of Minnesota College of Homeopathic Medicine and Surgery	2

MISSOURI

Washington University	15
St. Louis College of Physicians and Surgeons	50
University Medical College of Kansas City	4
Ensworth Medical College	1
Eclectic Medical University	1
Kansas City University of Physicians and Surgeons	4
St. Louis University	9
Kansas City College of Medicine and Surgery	1

NEBRASKA

University of Nebraska	20
Creighton University	2

NEW HAMPSHIRE

Dartmouth College	90

NEW YORK

Columbia University	105
Albany Medical College	30
New York University Medical College	34
University of Buffalo	7
Long Island College of Medicine	31
New York Medical College and Flower Hospital	18
Bellevue Hospital Medical College	28
New York Medical College and Hospital for Women	4
Eclectic Medical College of the City of New York	1
Woman's Medical College of the New York Infirmary for Women and Children	10
Syracuse University	7
Cornell University	32
New York University	31
Fordham University	2
University of Rochester	19

NORTH CAROLINA

Shaw University	4
Duke University	6

OHIO

Medical College of Ohio	1
Eclectic Medical College	3
Cleveland University of Medicine and Surgery	3
Miami Medical College	1
Western Reserve University	13
Pulte Medical College	1
Ohio State University	3
Cleveland–Pulte Medical College	3
University of Cincinnati	7
Columbus Medical College	1
Ohio State University College of Homeopathic Medicine	1

OKLAHOMA

University of Oklahoma	5

OREGON

University of Oregon	5

PENNSYLVANIA

University of Pennsylvania	79
Jefferson College	76
Woman's Medical College of Pennsylvania	44
Hahnemann Medical College and Hospital of Philadelphia	32
Medico-Chirurgical College of Philadelphia	13
University of Pittsburgh	4
Temple University	11
Electropathic Institute	1

TENNESSEE

Vanderbilt University	12
University of Tennessee	8
Meharry Medical College	5
Chattanooga Medical College	2
University of the South Medical Department	5
University of West Tennessee	2

SOUTH CAROLINA

Medical College of the State of South Carolina	5

TEXAS

University of Texas	4
Baylor University	5

VERMONT

University of Vermont	189
Vermont Medical College	1

VIRGINIA

University of Virginia	21
Medical School of the Valley of Virginia	2
Medical College of Virginia	14
University College of Medicine	2

WISCONSIN

University of Wisconsin	3
Marquette University	2

CANADA

McGill University	96
University of Montreal	47
Laval University	13
University of Bishop College Faculty of Medicine	2
Laval University Medical Faculty	6
University of Toronto	16
Medical Faculty of Trinity University	2
Victoria University Medical Department	2
Queen's University	15
University of Western Ontario	4
Dalhousie University	17
University of Alberta	1
University of Manitoba	3

OTHER COUNTRIES

Austria	6
Australia	1
China	1
Czechoslovakia	3
England	6
Finland	1
France	9
Germany	35
Greece	5
Guatemala	1
Hungary	2
Italy	26
Norway	1
Poland	1
Portugal	8
Russia	10
Scotland	5
Switzerland	9
Syria	7
Turkey	4

MISCELLANEOUS	
Graduates of institutions not listed as medical schools by the American Medical Association	542
Information received does not show graduation from a medical school	51
Total†	7527

†A discrepancy of one exists between this total and the 7528 of the *American Medical Directory*.

If all the graduates in 1938 from Harvard, Tufts and Boston University (the three Class A medical schools in Massachusetts) settled in this state they would have furnished only 279 doctors, or 97 less than the quota of replacements. It is doubtful, however, if the ratio of new doctors coming from all these schools, compared to the total required, is any greater than the ratio in the State already practicing, namely 55 per cent. Reducing the total number of graduates, 279, to this percentage there would remain, therefore, only 153 doctors from Massachusetts Class A schools opening an office in the State, thereby making it necessary for us to obtain 223 doctors from other institutions. Is it not important for the Massachusetts Medical Society, if we hold ourselves responsible for the medical welfare of all who live in the State, to consider the educational backgrounds of these 223 men? How many of them will come from unapproved medical schools I do not know, but I venture to say nearly a half. Indeed it appears that Massachusetts welcomes doctors from unapproved schools far more than any other state in the Union. Thus for the five years 1934 to 1939 the total number of graduates from unapproved schools registered in the United States was 866, and of these, 311, or over 35 per cent, secured their registry in Massachusetts; although they have not necessarily remained here to practice medicine, the Commonwealth has in a way become a dumping ground for these graduates.

The educational qualifications of these men unfortunately are evidently even worse than the badge of an unapproved school would imply, if the results for all examinations held by the Massachusetts Board of Registration in Medicine are similar to that in March this year, when of the 193 taking the examination 112 were repeaters, and all these repeaters were from unapproved schools, in contrast to no repeaters from approved schools. With socialized medicine creeping on us in one form or another, it behooves the citizens of Massachusetts and the Massachusetts Medical Society, the guardian of its health, to see to it that we shall not receive and allow to practice here men with such obviously inadequate training, so inadequate in fact that they are practically excluded from participation in medical work in all but a few states.

Some years ago while conducting a clinic for a group of students I showed as one of my patients a two-year-old child. The story ran that at the age of one year and nine months, while at a summer resort, she became ill and her parents called in the only available doctor, who chanced to be a very young man. Nevertheless he grasped the opportunity, studied the situation carefully and asked for a specimen of urine. The child had diabetes. The symptoms and signs of the illness had not been particularly outstanding, but the alertness and thoroughness of the doctor resulted in that early diagnosis which is as important in diabetes as in tuberculosis. And now eight years after beginning to take insulin the child looks as healthy as her companions and perhaps even more so. The moral of this story, which I pointed out to the students, was not that the doctor was young, alert or painstaking, but rather that he graduated from Middlesex, where despite the meagre instruction offered he had learned enough to make a diagnosis.

I consider it appropriate, therefore, that I discuss from the point of view of socialized medicine the situation at the Middlesex University School of Medicine. This school was founded in 1849 as the Worcester Medical Institution, later was forced to suspend, reopened in 1914 as the Middlesex College of Medicine and Surgery, subsequently becoming Middlesex College, and in 1937 was absorbed by Middlesex University. The early records were lost in a fire, but from June, 1915, to date it has graduated 918 students. For the years 1934 to 1938 inclusive its graduates stand in numbers next to those of Harvard, Tufts and Boston University (Table 2).

TABLE 2. *Total Graduates, 1934–1939, from the Medical Schools of Harvard University, Tufts College, Boston University, Middlesex University and Yale University.*

INSTITUTION	1934	1935	1936	1937	1938
Harvard University	132	137	134	139	135
Tufts College	103	119	116	119	106
Boston University	53	56	64	54	45
Middlesex University	41	57	64	83	46
Yale University	40	47	47	48	38

Two hundred and thirty-two graduates of Middlesex were practicing in Massachusetts according to the *American Medical Directory* for 1938, and probably a considerably greater number, estimated at 640.* Only a part of these doctors passed the state examination at their first trial, and I suspect many required three or more trials. Not a single one of these graduates was passed by the National Board of Medical Examiners because that board will not allow them to take the examination. Yet, according to the catalogue of the Middlesex University School of Medicine for 1939 and 1940, there are 304 students now in that school preparing to enter the practice of medicine,

*Included among "graduates of institutions not listed as medical schools."

and they can hardly escape knowing that when they have finished their course they must settle in Massachusetts or in one of a few other states in the Union.

What are you as members of the Massachusetts Medical Society going to do about it? Before attempting to suggest an answer to that question I shall ask, What is Middlesex going to do about it? This is particularly important because in January, 1941, the school comes up before the authority which by law has been created to decide whether its graduates are to be admitted to Massachusetts examinations.

Middlesex University School of Medicine has wonderful opportunities before it, relatively far more, and also relatively far more easily attained, than those of Harvard, Tufts or Boston University. Will it seize them? In order for it to do so there seems to me to be certain essentials, which I shall enumerate.

A Reorganization of the Board of Trustees. The days of proprietary medical schools or of schools with the least semblance of control by a few interested, though excellent, doctors, especially by teachers on its faculty, have passed. The country will not tolerate them. The public demands that the trustees of medical schools shall be divorced from personal interests in the education of the students. Here lies, in my opinion, the first and greatest opportunity for Middlesex. If that medical school should have on its board of trustees men like Mr. Stuart Rand, who organized this year's Community Fund of Boston and is now, to the satisfaction of us all, a trustee of the Boston City Hospital, Father Robert Barry of the Catholic Charitable Bureau, whose name is a household word because of his unremitting interest in all our state and city charities, Dr. David Scannell, whose years of service on the Boston School Board and of devotion to the Boston City Hospital receive just acclaim, and Dr. Charles F. Wilinsky, whose lifelong work in many capacities, combined with extraordinary organizing ability, has been for the highest ideals of health for Boston, then most of the prejudice against Middlesex would disappear.

Better Equipment and More Funds for Teachers. The education of students at Middlesex is deficient, and in order to provide better education more money is needed for equipment and faculty even though it has built new buildings and added many full-time teachers. The students pay $410 yearly, and still larger sums if we add the amounts to which they are obligated by the purchase of books and other fees, but large as is the aggregate from 304 students, we know it is insufficient. It is said by some that the minimum amount per year per student necessary to furnish a suitable medical education is $1000. The medical schools of Harvard and Yale universities have budgets far in excess of this amount.

Yet if one may tread upon dangerous grounds, may I point out two facts? First, that so far as published very little of the money of Middlesex goes to research. The word "research" appears upon one page alone in its 1939–1940 catalogue, and ideal as it is to have research in a medical school, there is something to be said for the pedagogical education of medical students, pure and simple. It is true that at the schools with the highest budgets the education of the student is not a by-product of medicine, but it happens that along with the teaching of medicine those schools have such an honorable history and their management is so trusted by men and women of means that they have been endowed with large sums for research which swell their budgets and in their administration help to raise the standard of education and ideals of its student body, although few would claim that they were absolutely essential to the education of students.

No one favors more, or seeks more zealously to promote, research in medicine than do I, but we are faced now with a definite dilemma here in Massachusetts in that we need good doctors; if the three Class A medical schools cannot or do not furnish them we must seek them elsewhere, and under the existing laws of the State it is certain that for the next six years at least a considerable proportion of these men will come from Middlesex.

Great improvement in the medical education offered at Middlesex could be accomplished without tremendous changes in its budget. If one of the larger medical schools in the country should strive to increase its budget 10 per cent, it might require $100,000 or the interest at 3 per cent on over $3,000,000, whereas if Middlesex increases its budget 10 per cent, the sum would be much smaller. That would not be enough, to be sure; but suppose Middlesex should expend next year $30,000 additional on equipment and teaching and the following year do the same or add another $30,000, what would you say to that? Probably you would reply that the budget would still be inadequate, and especially so, because Tufts and Boston University are each seeking an additional $1,000,000 in endowment although their budgets are greater than that of Middlesex. I grant your contention that a $1,000,000 endowment alone or its guaranteed equivalent of $30,000 a year for its budget would still be inadequate to make Middlesex a Grade A medical school. Something else is necessary.

High Standards for Admission of Students and Limitation of Enrollment. The number of students in Middlesex appears excessive according to generally accepted standards for the facilities offered. In the Middlesex 1939–1940 catalogue there are 107 students in the first-year class, 76 in the second, 54 in the third and 67 in the fourth. Many will take exception to the contrast between the number enrolled in the first-year and fourth-year classes, but this is largely due to the increasing size of the recently entering classes. Nevertheless, a limitation of students brought about by higher premedical requirements both in scope and passing marks for admission, and limitation of the total numbers of students in each class to an enrollment which is considered reasonable by the great majority of medical schools in the country would seem to be absolute requisites on the part of Middlesex if it is to gain the respect of both citizens and doctors in this state.

To make good doctors, one must start with good men. One can give good technical training to a man for four years and teach him much about medicine, but unless the man has native talent and ability, he will not be able to take his place in the community or in the field of medicine. In this regard, a college (premedical) course of at least two, and preferably three or four, years in a recognized college serves as an excellent proving ground. If the man survives this, makes good marks and shows evidence of good moral character, he is much more apt to make a good doctor.

More clinical facilities for the education of students are necessary before Middlesex medical students can receive what many believe to be sufficient medical education, and at the moment these facilities are not available to them. The students are in the position of the small boy whose mother says he must learn to swim, but does not arrange for him to go near the water. And yet there are plenty of clinical facilities in the State which are not utilized. With automobiles today one can travel far. Already we have sanatoriums for tuberculosis belonging to the city, the county and the State. We have state hospitals. There is Tewksbury, 25 miles from Boston, a state institution where a wealth of superb clinical material exists; and as everyone knows, as soon as students are admitted to a hospital, standards of treatment advance. I believe doors would swing open in other hospitals if the requirements listed above were met.

Attitude of Alumni. Finally, the attitude of the alumni of Middlesex toward medicine in general and their alma mater in particular will do more to advance that school than anything else. The alumni know best the disadvantage under which they labored in securing an education and the embarrassing situations in which they have been placed since graduation, when they are asked where they graduated, and the difficulties they have encountered in obtaining hospital training unless they have gone far afield to secure it — to Vienna, Germany, France or England. They more than any others can bring pressure on their alma mater to improve existing conditions, and more than any others can help by the combined expression of their views on the points I have raised and especially by securing funds to finance such a plan. There have been 918 graduates from Middlesex since 1915. Probably a half to two thirds of these are now living and practicing in this state. If it was demonstrated to these men that the school would be reorganized, changes made in its board of trustees, stricter scholarly requirements enforced for the admission of students, limitation of enrollment and an open-book financial policy adopted, I believe that those men could secure from their own number, their patients and friends guarantees of $30,000 yearly for the next two years toward the maintenance of the institution, and it would be for their own personal advantage to do so as well.

If Middlesex University School of Medicine could be raised out of the class of unapproved schools — and that is what I should like to see done — I suspect it would be as zealous as Harvard, Tufts, Boston University and the Massachusetts Medical Society to exert its influence in urging that Massachusetts follow the example of the country as a whole and forbid graduates of unapproved schools in the future from entrance to our state-board examinations.

The Attitude of the Massachusetts Medical Society Toward Middlesex

It is all very easy to say what Middlesex could or should do, but what shall be the attitude of the Massachusetts Medical Society toward Middlesex? First of all, may I point out what our society is already doing? One hundred and twenty-two of their graduates are already members of the Massachusetts Medical Society according to the *American Medical Directory* of 1938, and very likely twice or thrice this number. As soon as any others can meet all our requirements they should be admitted to membership. Once admitted, they are on an equal footing with all our members in our meetings and on our committees. They are fellow members, and for each fellow member of the Massachusetts Medical Society all its members have a personal interest and responsibility.

Second, the Massachusetts Medical Society is fostering graduate courses. These courses are steadily increasing in number, diversity and ex-

cellence. All are open to the graduates of Middlesex, whether or not they are members of the Society. This is an illustration of what we are doing to help physicians who may not have had all the opportunities they desire. And I may add here that of the 120 doctors attending the last three sessions of the special courses for graduates given by the Suffolk District Medical Society, 26 came from Middlesex. Middlesex was well represented on the committee which planned the courses. I consider it very essential to have this fact stated, namely, that the Massachusetts Medical Society is already doing a great deal in an educational way to help Middlesex graduates.

The Boston Medical Library opens its doors to the students of Middlesex, but I suspect that if certain policies at Middlesex were altered, it would welcome the opportunity to be of far greater assistance to that school.

It is true that Middlesex graduates cannot join the staffs of the larger hospitals without the hospitals losing their rating by the American College of Surgeons. As a society we are not responsible for that situation. Whether under any and all conditions the large hospitals in our state should feel bound to conform to this ruling is a question which can well come up for discussion and careful deliberation. It is a fact that each Middlesex graduate who works to the utmost to improve his knowledge and practices medicine on the highest possible plane advances the day when he and his fellow alumni will be given an opportunity in institutions of this group. I am under the impression that ways can be found by which, if the members of the Massachusetts Medical Society and of Middlesex faculty and its graduates assiduously devote themselves to the problem, opportunities for better clinical facilities for the education of Middlesex students will be found. But I frankly do not believe that these changes and many, many other advantages can be brought about or offered until absolute evidence is presented before the State Approving Authority that greater efforts than hitherto manifest have been made to meet its standards.

If in what I have said it is recognized that I have tried to speak honestly, fairly and cooperatively, and have made real the problem of securing well-trained doctors for Massachusetts, I shall be content, because you members of the Massachusetts Medical Society, including also graduates of Middlesex, can do the rest.

81 Bay State Road.

KNEE INJURIES IN ATHLETICS

A Study of End Results

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WHAT eventually happens to the knee injured in college athletics is a question that has not been satisfactorily answered. This paper presents an analysis of 193 cases in which the end results could be obtained, out of a group of 259 major injuries of the knee treated at Springfield College from 1924 to 1937.

This group is unique in that this college of about five hundred students trains students to be physical directors of Y.M.C.A.'s, schools and colleges. Accordingly, practically all the individuals reported continued in much more strenuous activity than the average college graduate. While in college they participated in football or soccer in the fall, gymnastics, basketball, swimming and wrestling during the winter, and baseball, track and lacrosse in the spring. There was a minimum requirement of one hour of athletic work a day, but the average exceeded eight hours a week. After graduation most of the men coached these sports and frequently took a very active part in them. We know of no other group whose members have continued in such strenuous forms of athletics.

Although the literature is replete with articles concerning knee injuries, with excellent discussions of the anatomy, mode of injury, diagnosis and operative treatment, the analysis of end results leaves much to be desired. I could find but three references to the effects of conservative treatment. Dickson[1] states that of 73 cases 59 recovered, 9 did not and the outcome in 5 cases was unknown. Lasher[2] reports that 90 per cent of his unoperated cases continued to give trouble. Kulowski[3] is more optimistic, saying, "Of closed reductions, the results were very good in early, uncomplicated cases that were sufficiently immobilized." None of these reports give the criteria used in judging the results.

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There have been several good reports of the results of operative treatment, but it is not feasible to compare them because of the varying standards. In a series of 88 cases of removal of a cartilage, Dickson[1] reports 86 per cent with good results, 13 per cent with incomplete and 1 per cent with unsatisfactory. By a good result he means a return of function, relief from disability, resumption of former occupation and normal activity. An incomplete one means relief of symptoms but does not permit extensive activity; the results in this group are believed to be due to secondary changes such as injury to articular cartilage, arthritic changes, relaxation of the ligaments and loss of muscle control.

Henderson[4] gives his results in 238 of 256 cases of cartilage removal; 77.2 per cent of the patients were entirely relieved, 14.4 per cent improved, and 8.4 per cent not improved. In 42 cases where the lesion was doubtful at operation, 37 per cent were cured and 40 per cent were unimproved.

Lantzounis,[5] reporting on a series of 142 operations, classifies the results in 85 per cent as excellent and in 15 per cent as good, although 20 per cent of the patients with excellent results still had some minor symptoms.

Shands, Hutchison and Ziv[6] in their report of 48 cases use a classification somewhat similar to that adopted in this paper, as follows: "good" means that the knee can be used as effectively for strenuous exercise as before operation; "fair" that there is little or no catching, moderate pain and definite improvement; and "poor" that there is pain, locking or catching. On this basis the results were: good, 71 per cent; fair, 19 per cent; poor 8 per cent; questionable, 2 per cent. Forty per cent of the patients stated that the knee functioned as well as the normal knee.

Spira[7] reports on 76 operations in patients followed for ten years. His classification of results is: "very good," indicating free motion, no pain, resumption of occupation; "good," indicating pain on long walks or in bad weather, or slight impairment of function, such as a weak quadriceps; "bad." On this basis he rated 71 per cent of results very good, 22 per cent good, and 7 per cent bad. In the 41 cases of injury in athletics 82 per cent were very good, and the remainder good.

Other interesting end-result figures are given by MacAusland,[8] Buzby,[9] Kulowski[3] and Lasher,[2] but after careful analysis those that have been quoted impress me as being the most valuable.

CLASSIFICATION OF CASES

Football was responsible for the greatest number of knee injuries. The distribution by sports was football, 90 cases (47 per cent); soccer, 24 (12 per cent); basketball and gymnasium activities, 16 each (8 per cent); track, 10 (5 per cent); wrestling, 9 (5 per cent); baseball and lacrosse 6 each (3 per cent); and 16 (8 per cent) in various other activities.

It is worthy of mention that during this period there has not been a single fractured femur at the college. There were 2 cases of fractured patella which are not included in this analysis. Minor injuries are also excluded, and the few where the individual had forgotten about the injury years later were so classed, even though the original records indicated that they should be included.

The end results were determined on the basis of a questionnaire covering every abnormality, even of the slightest degree, that had been noticed since the completion of treatment. In about 30 per cent of the cases a late examination was also available. The following classification was adopted:

Perfect.	4*a*.	No further trouble.
	4*b*.	Recurrent trouble for a year or more, but complete recovery subsequently.
Good.	3*a*.	Minor abnormalities, such as aches in damp weather or numbness.
	3*b*.	Minor pain, but not interfering with athletic activity or requiring support.
Fair.	2*a*.	Weakness interfering with athletics or requiring support.
	2*b*.	Occasional slipping, swelling or severe pain, although athletics could still be continued.
Poor.	1.	Interference with ordinary use or prevention of athletic activity.

The time from the end of treatment to the determination of the end result varied from one to thirteen years and averaged six and a half years. There was no significant variation in the follow-up period among the various types of injury.

Each patient was placed in one of the six following groups: simple traumatic synovitis with effusion; sprain of the lateral ligament; injury of the semilunar cartilage, treated without immobilization; questionable injury of the semilunar cartilage, treated conservatively; injury of the semilunar cartilage, treated by immobilization; and injury of the semilunar cartilage, treated by operation.

I realize that there are probably some errors in

the assignment of cases to these groups. Anyone who has seen a large number of knee injuries appreciates the difficulty of accurate diagnosis. The internal lateral ligament is intimately attached to the internal semilunar cartilage, and thus any severe sprain of the ligament puts some strain on the cartilage. If the tenderness over the cartilage is only in the line of the ligament and there is no history of locking, the case must be considered merely one of sprain. Several cases so diagnosed were later proved to have cartilage injury, and in that event the grouping was changed. Several cases in the sprain group probably had cartilage injuries. No case was considered as having a cartilage injury without a history of locking or slipping with tenderness over the cartilage. Cases with such tenderness but without the characteristic history of locking or slipping were placed in the questionable group.

In general, the apparently milder grades of cartilage injury were treated by the use of crutches, Ace bandage and physiotherapy; the more severe cartilage injuries were immobilized in a plaster cast, while in those that did not respond to conservative treatment the cartilage was excised. Thus the more favorable the original prognosis, the more conservative was the treatment given.

TRAUMATIC SYNOVITIS

Practically all the 19 patients with uncomplicated synovitis with effusion wore Ace or Bender bandages and had physiotherapy consisting largely of whirlpool baths. In the more recent cases sponge-rubber pressure was used in addition to the elastic woven bandage. In only 1 case in this group was aspiration of the effusion done. Ten of the 19 patients were on crutches for from one to twenty-one days, with an average of six and a half days and a median of five. The time lost from physical practice, that is active athletics, varied from three days to eight weeks, with an average of thirteen days and a median of seven days. The time required for complete recovery was one to twelve weeks, with an average of four weeks and a median of three and a half weeks.

TABLE 1. *End Results of Traumatic Synovitis.*

GRADE	NO. OF CASES	PER CENT	
4a	13	68	
4b	1	5	74 perfect
3a	2	11	
3b	1	5	16 good
2a	0	0	
2b	2	11	11 fair
1	0	0	0 poor
Total	19		

The comments on the 2 cases classed as 2b were "pain and swelling after exercise" and "continued use in football with repeated aggravation; repeated injury in 1935 and 1936 [the original injury occurred in 1932] from bruising in wrestling and lacrosse, not totally disabling; last winter the knee swelled a bit if struck."

Apparently the prognosis of simple synovitis with effusion is good, with approximately 90 per cent of the results satisfactory. There is a suggestion that the synovia becomes somewhat vulnerable to repeated trauma.

SPRAIN OF THE LATERAL LIGAMENT

This is one of the common knee injuries. There were 59 cases, in 54 of which the internal lateral ligament was involved and in 5 the external. Four cases had significant effusion, 1 of which was aspirated. Treatment in general consisted in physiotherapy, Ace bandage and crutches. In 4 cases the knee was immobilized, and in 8 it was supported with adhesive strapping. Thirty-two patients were on crutches for two days to three weeks, with an average of eight days and a median of one week. The time lost from physical practice varied from none to sixteen weeks, with an average of three weeks, omitting 1 patient who was barred from practice for two years. The median loss of time was two weeks. The time required for complete recovery varied from one week to five years, with an average of twenty-seven weeks. Omitting the 3 cases in which more than two years was required, the average time to complete recovery was nine and a half weeks, and the median seven.

TABLE 2. *End Results of Sprain of Lateral Ligament.*

GRADE	NO. OF CASES	PER CENT	
4a	17	29	
4b	10	17	46 perfect
3a	10	17	
3b	11	19	36 good
2a	5	8	
2b	5	8	16 fair
1	1	2	2 poor
Total	59		

Characteristic comments in each group were as follows: 4*b*: "Fresh injury two or three years later; now normal." 3*a*: "Occasional ache in damp weather; had arthritis in 1933 [original injury in 1929]." 3*b*: "Fatigue after strenuous exercise, followed by weakness; bothers on kneeling; knee functions well in all forms of athletics, including football." 2*a*: "On a quick shift, as in tennis, knee gives way; bandage usually worn for play." 2*b*: "Vigorous jumping or deep knee-bending causes catching; knee favored in physical activity but has caused inconvenience only once or twice a year." 1: "Considerable trouble in the last two years [seven and a half years after injury]; knee is sore and swollen at times, and requires support in the slightest athletic exertion."

A distinct sprain of the internal lateral ligament of the knee is apparently apt to have marked sequelae. Probably some of these results are due to associated semilunar cartilage injury. Less than half the patients have continued symptom-free, although in four fifths of the cases satisfactory end results were obtained.

INJURY OF THE SEMILUNAR CARTILAGE TREATED WITHOUT IMMOBILIZATION

This group of 40 cases was considered to have injury of a semilunar cartilage diagnosed by a characteristic history of adequate trauma, locking or slipping, with tenderness localized over the cartilage. The internal meniscus was involved in 37 cases and the external in 3. In 6 cases the locking was so complete that manipulation was required by the surgeon in order to reduce it. Effusion was marked in 12 cases and was treated by aspiration in 2 of these.

The treatment consisted essentially in rest, support and physiotherapy. Thirty patients used crutches for four days to four months, with an average of fifteen days and a median of ten. Ten patients did not use crutches. Practically all wore Ace or Bender bandages. Six wore braces, usually of the Jones type, while in the same number the knee was supported by adhesive strapping, usually of the Simpson type. Physiotherapy consisted chiefly in whirlpool baths and massage, and active exercise without weight-bearing.

TABLE 3. *Corrected End Results of Injuries of the Semilunar Cartilage, Treated without Immobilization.*

GRADE	NO. OF CASES	PER CENT	
4a	4	8	
4b	6	11	19 perfect
3a	6	11	
3b	3	6	17 good
2a	2	4	
2b	13	25	28 fair
1	19	36	36 poor
Total	53		

The time lost from physical practice varied from none to forty-eight weeks, with an average of five weeks and a median of four. The time needed for complete recovery as stated by 21 patients was from two weeks to four years, with an average of eleven months and a median of five. Nineteen patients continued to have sufficient annoyance not to be rated as completely recovered.

Of the 40 cases treated only in this manner, 25 per cent showed perfect results, 23 per cent good, 38 per cent fair and 15 per cent poor. There were 13 cases originally treated as in this group in which the cartilage was later excised; 3 of the patients were found to have crucial ligament tears. By adding these 13 cases to Grade 1 (poor results) the statistics for the 53 cases are as shown in Table 3.

Some of the comments according to grade were as follows. *4b*: "Knee weak for two years; now well [five years since injury]." *3a*: "Knee is normal for all sports, though there is an occasional twinge when it is twisted outward"; "Weakness in knee when fatigued [a professional dancer]." *3b*: "Occasional slight pain [a professional wrestler]." *2a*: "Damp weather affects the knee; brace is worn during strenuous exercise." *2b*: "After a slight twist, limped for a day or two; the knee was normal for the next six months; it seldom affects work." 1: "A sudden step on an uneven surface bothers"; "Knee slips out of joint on the slightest provocation."

QUESTIONABLE INJURY OF THE SEMILUNAR CARTILAGE

There were 22 cases in which an accurate diagnosis was impossible. In general these patients experienced tenderness over the semilunar cartilage, but there was no characteristic history of locking or slipping. There was marked effusion in 4 cases. The treatment was similar to that of the first group, that is rest, support and physiotherapy. One patient wore a brace, and 4 used adhesive strapping. Sixteen were on crutches for an average of twelve days and a median of seven. Six did not use crutches.

The time lost from physical practice varied from none to twenty-four weeks with an average of five weeks and a median of two. Thirteen patients gave the time needed for complete recovery as from one to thirty-six months, with an average of six months and a median of one.

TABLE 4. *End Results of Questionable Injuries of the Semilunar Cartilage.*

GRADE	NO. OF CASES	PER CENT	
4a	3	14	
4b	5	23	36 perfect
3a	1	5	
3b	6	27	32 good
2a	4	18	
2b	3	14	32 fair
1	0	0	0 poor
Total	22		

Typical comments in this group were as follows. *4b*: "Knee became dislocated two or three times a year until three years ago; has been well since then." *3a*: "Weakness at times of strenuous use; knee otherwise perfectly good." *3b*: "Slight clicking beneath patella; no pain, disability or tenderness; full physical practice; knee becomes sore in high jumping but recovers quickly." *2a*: "Knee slips in sports, but if strapped up does not come out of joint; no pain under normal conditions." *2b*: "Weakness in knee and a feeling of inse-

curity; joint slips out if weight is on the leg with the knee straight and a sudden step; there is a mental hazard in athletics and gymnasium demonstrations — a catching and slipping sensation."

INJURY OF THE SEMILUNAR CARTILAGE TREATED BY IMMOBILIZATION

The patients in this group of 24 cases appeared to have somewhat more serious injuries than those in the preceding group, and were treated with the aid of plaster casts. The external cartilage was involved in 3 cases and the internal cartilage in 21. In 12 cases the cartilages were so locked that manipulation was required for reduction, general anesthesia being necessary in 5 cases. There were 9 cases of marked effusion, 1 of which was aspirated.

The cast was worn from one to seven weeks, the average being four weeks. Recently the standard period has been three weeks. Usually the cast has been bivalved for physiotherapy after one or two weeks. In all cases the patient has been instructed to endeavor to prevent muscle atrophy by active muscle contraction, repeated literally thousands of times a day. Full weight-bearing was usually delayed for a further period. Crutches were used from one to eight weeks for an average of four weeks, partial weight-bearing being permitted for the latter part of the period. Active exercise with minimum weight-bearing, such as swimming and bicycling, has been encouraged during convalescence from all knee injuries.

The time lost from physical practice varied from one to fourteen weeks, with an average of eight. The interval to complete recovery as stated by

TABLE 5. *Corrected End Results of Injuries of the Semilunar Cartilage, Treated with Immobilization.*

GRADE	NO. OF CASES	PER CENT	
4a	8	23	
4b	6	17	40 perfect
3a	1	3	
3b	1	3	6 good
2a	2	6	
2b	2	6	11 fair
1	15	43	43 poor
Total	35		

15 patients varied from one to twenty-four months, with an average of five months and a median of three.

The results in 24 cases treated by immobilization alone were perfect in 58 per cent, good in 8 per cent, fair in 17 per cent and poor in 17 per cent. Correcting the tabulation by adding to Grade 1 the 11 cases originally treated in this group and later subjected to operation, we obtain the figures from 35 cases shown in Table 5.

Some of the comments made by this group were as follows. 4*b*: "Knee has slipped three or four times but has gone back easily; no swelling; no trouble in vigorous exercise for last year and a half"; "For two years knee would collapse when boarding a streetcar or the like, swelling and remaining swollen for several days; no discomfort or weakness since 1929." 3*a*: "Knee good as ever; rarely a click in damp weather." 3*b*: "A quick twist sometimes causes pain." 2*a*: "Sharp pain still occurs occasionally on twisting; have worn a brace during exercise for five weeks." 2*b*: "Several minor slippings with effusion." 1: "Knee becomes dislocated in athletics; it twists and swells if severely wrenched and locks."

TABLE 6. *End Results of All Probable Injuries of the Semilunar Cartilage, Treated Conservatively.*

GRADE	NO. OF CASES	PER CENT	
4a	15	14	
4b	17	15	29 perfect
3a	8	7	
3b	10	9	16 good
2a	8	7	
2b	18	16	24 fair
1	34	31	31 poor
Total	110		

If the 22 cases with a doubtful diagnosis of injury of the semilunar cartilage are assumed to be those of definite injury, the end results of the total 110 cases conservatively treated are as shown in Table 6.

INJURY OF THE SEMILUNAR CARTILAGE TREATED BY OPERATION

There were 29 patients who underwent operation for the removal of injured menisci. The previous history gave an average of 2.5 definite injuries preceding operation. In 14 cases there was locking that could not be reduced by the patient. In 9 of these this could be reduced by manipulation without anesthesia, while in 5 general anesthesia was required. There was marked effusion in 11 cases. The previous treatment had been immobilization in 13 cases. Five patients had had no significant previous treatment. The interval from first injury to operation varied from nine days to nine years, with an average of nineteen months. Three cases were operated on a second time; 1 for the removal of the external cartilage, 1 for a retained fragment of cartilage and 1 for a synovial fringe.

Four patients were operated upon by other surgeons, which leaves 25 cases where the operative findings are known. In 15 of these the cartilage was fractured, 5 of the fractures being of the bucket-handle type. There were synovial fringes, fat tabs or synovial villi in 13 cases. The crucial

ligaments were torn in 4 cases, and in 2 of these the Bennett type of fascia-lata repair was done. In 8 cases both cartilages were removed at the same operation, in 4 through separate lateral incisions, and in 3 through a patella reflecting incision; in 1 it was possible to remove the external cartilage through the usual median incision. In only 1 case was the external cartilage removed without the internal. The routine incision was a vertical incision of the Jones or hockey-stick type. Each layer was incised in a different plane in order to minimize scar adhesions. Usually a tourniquet was used, and this was removed after the application of a padded circular plaster cast.

The anesthetic adopted was local novocain in 16 operations and ether in 13; spinal anesthesia was used in 1 case. There were no difficulties referable to the anesthesia except in 1 case, in which the skin over the entire area on the mesial aspect of the knee which had been infiltrated with novocain sloughed off. Fortunately the joint and ligaments were not involved. Following skin grafting, a perfect result was obtained, and the patient later became captain of the college gymnasium team.

The usual postoperative procedure was to start active motion on the fifth day and at the same time to replace the cast with an Ace bandage. In some of the earlier cases and in those with torn crucial ligaments, the cast was used for longer periods, up to seven weeks. In such cases it was bivalved in order to permit exercise and physiotherapy. After about a week the patient was up on crutches and continued to use them at least until all effusion had subsided. The time on crutches varied from one to seven weeks, with an average of three. The time from operation to walking without assistance was from ten days to eight weeks, with an average of four weeks; the most frequent time was three weeks. The time lost from college classes varied from one to four weeks, with an average of three weeks. The loss of time from physical practice was from one to thirty months, with an average of five months and a median of three. Nearly half the patients resumed physical practice within two months.

TABLE 7. *End Results of Injuries of the Semilunar Cartilage, Treated by Operation.*

GRADE	NO. OF CASES	PER CENT	
4a	10	34	
4b	0	0	34 perfect
3a	7	24	
3b	2	7	31 good
2a	2	7	
2b	7	24	31 fair
1	1	3	3 poor
Total	29		

The final results are shown in Table 7.

Some characteristic comments were as follows. 3*a*: "Played varsity football in three months; the knee is now a little numb below incision, and sometimes aches on stormy days." 3*b*: "Limp when fatigued; do not seem handicapped in any activity." 2*a*: "Play basketball, touch football and baseball sometimes without a brace, but an element of fear enters my mind and I wear the brace for the sake of safety." 2*b*: "Take part in all athletics; no trouble if I keep the leg in excellent condition; so long as I work it hard the knee functions finely, but if I neglect this regimen for two or three weeks it slips, catches, causes pain and swells, and it is impossible to use it for a week or more; I am entirely satisfied with the results." 1: (This patient had a secondary operation for removal of a synovial fringe which caused a catching sensation. This was done sixteen months after the primary operation. Examination eight months after the final procedure showed an apparently normal knee with full painless motion and no tenderness. The patient attributed the full return of strength to a daily three-mile run.) "Still weak. The knee swells when used vigorously; catching is apparently caused by a growth in front of the knee joint; the leg will not bear weight in a bent position [report six years after operation]."

An attempt was made to correlate the results with various factors. At first there seemed to be little relation between the time from injury to operation and the end result. However, when the cases were divided into three sub-groups the results appeared to be best in the early cases: of 5 operations within one month of injury, 4 gave Grade 4 or perfect results, and 1 gave a Grade 2 result; in other words, the results were 80 per cent good. The next best results occurred in the 8 late cases, in which there was an interval of over two years between injury and operation. Only 1 result was rated as Grade 4, but 5 were rated as Grade 3, and 2 as Grade 1, in other words, 75 per cent of the results were good. In the intermediate group of 16 cases, with an interval of one month to two years between injury and operation, only 9, or 56 per cent, were classified as good, that is of Grade 3 or 4. This suggests that prompt operation avoids the annoying complications resulting from repeated synovial irritation. The relatively good results in the late cases suggest that they were less severe injuries in which operation did not seem urgent.

Of the 15 cases of fractured cartilage, 6 gave results that were rated Grade 4 and 6 as Grade 3, while the results in 2 were of Grade 2 and in 1 of Grade 1; in other words, there were 80 per cent good results. This is in accord with Henderson's[4] findings, where the results were better

in the more obvious cartilage injuries. Similarly, of the results in 17 cases with a previous history of locking, 47 per cent were of Grade 4 and 70 per cent of Grade 3 or 4.

The results in 13 cases with synovial tabs which required excision were also satisfactory. Forty-six per cent were of Grade 4 and 77 per cent were Grade 3 or 4. Of the 11 cases with marked preoperative effusion, 64 per cent of the results were rated as Grade 3 or 4.

The type of incision was apparently of no significance. Removal of both cartilages gave results slightly better than the general average. Of those in the 9 cases, all but 1 were rated as Grade 3 or 4, or 89 per cent good.

The anesthetic apparently had no significant effect on the results. Of the 16 cases done under local novocain anesthesia, the results in 5 were rated as Grade 4, and in 6 as Grade 3, or 81 per cent good. Seven or 54 per cent of the 13 operations performed under ether gave good results. The result in the 1 case done under spinal anesthesia was placed in Grade 4.

Of the 4 operations performed by other surgeons, 1 gave a Grade 4 result and 3 Grade 2 results.

There were 4 cases with associated torn crucial ligaments. In 2 of these there was no marked abnormal mobility preoperatively; the result of one was rated as Grade 4 and the other as Grade 2. The 2 cases with marked abnormal mobility received the Bennett type of fascia-lata repair, and the results were rated as Grade 2.

DISCUSSION

A summary of final results of cartilage injuries arranged according to treatment is shown in Table 8. "Good" includes all Grade 3 or 4 results, and signifies that the patients engaged in strenuous athletics with no difficulty. "Fair" represents the Grade 2 results, indicating that while engaging in active athletics the knee gave trouble or required some support. Where there was distinct difficulty or inability to use the knee for strenuous activity, or operation was resorted to, the results are classified as "poor."

TABLE 8. *Comparative Results of All Injuries of the Semilunar Cartilage.*

Result	Type of Treatment: Not Immobilized		Immobilized		All Conservative		Operative	
	No. of Cases	Per Cent	No. of Cases	Per Cent	No. of Cases	Per Cent	No. of Cases	Per Cent
Good	19	36	16	46	50	45	19	66
Fair	15	28	4	11	26	24	9	31
Poor	19	36	15	43	34	31	1	3
Totals	53		35		110		29	

Inasmuch as the best proof of serious damage of a semilunar cartilage short of surgical exploration is locking, a comparison is made of the groups that required manipulation by the surgeon before the knee could be extended. The results of the 18 locked cases treated conservatively were 72 per cent good, 17 per cent fair and 11 per cent poor. Correcting these figures by adding all the operative locked cases to Group 1 of the nonoperative cases gives the results shown in Table 9.

TABLE 9. *Corrected End Results in Locked Cases.*

Result	Type of Treatment: Not Immobilized		Immobilized		All Conservative		Operative	
	No. of Cases	Per Cent	No. of Cases	Per Cent	No. of Cases	Per Cent	No. of Cases	Per Cent
Good	5	33	8	47	13	41	11	79
Fair	1	7	2	12	3	9	3	21
Poor	9	60	7	41	16	50	0	0
Totals	15		17		32		14	

The figures for this group parallel those in the larger groups closely enough to constitute some evidence of the correctness of the diagnoses, although general results were better in the locked cases.

Since there is such a wide variation possible in the classification of a result by such a term as "good" or "fair," it is to be hoped that someone will report a larger series with comparable subgroups, since the number of cases here given is too small to make the sub-groups statistically accurate. If the mere ability to engage in athletics were considered sufficient reason to classify a result as good, all the operative results might be so classified. Yet to the individual the various abnormalities are of real significance.

The large number of knee injuries that continue to cause trouble make this the most important group of all athletic injuries. This particular series of men, who continue in their life work as physical directors, is an especially valuable one in that it demonstrates what an injured knee does under continued strain. In general, the more strenuous the use the greater the discomfort. The one exception to this rule, where the patient reported that his knee was perfect only when he used it vigorously, is an illustration of good muscle tone's protecting torn or stretched ligaments. It is probable that some of the symptoms reported are due to subsequent injuries.

One possible complication that has not been discussed in any group is limitation of motion. No individual made such a complaint, and in the

patients examined there was no significant limitation.

SUMMARY AND CONCLUSIONS

The end results of a series of 193 injuries to the knee have been analyzed. Eighty-nine per cent of the cases of simple synovitis and 81 per cent of those with a lateral ligament sprain showed good final results. All the patients were able to continue active athletics. The results of semilunar cartilage injury treated by immobilization (46 per cent good) are sufficiently better than those treated merely by bandaging, rest, crutches and physiotherapy (36 per cent good) to warrant the use of a plaster cast as soon as a diagnosis can be made. The results of conservative treatment are so satisfactory, nearly half being good, that we believe it should be tried in nearly all cases before resorting to operation. Of the cases that still have disabling symptoms the majority can be cured (66 per cent good results), and all have been sufficiently improved by operation to engage in active athletics.

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SULFANILAMIDE IN THE TREATMENT OF GONORRHEA*

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THE action of sulfanilamide in gonococcal infections has received considerable attention ever since the report of Dees and Colston.[1] Its efficacy has been reported as varying from 40 to 90 per cent.[2, 3]

In undertaking an evaluation of sulfanilamide, a preliminary experimental study was carried out by Cohn,[4,5] who was successful in producing an infection in mice by intraperitoneal inoculation. He was able to show that the fatal results following the production of gonococcal infection in mice could be prevented by a subcutaneous injection of 1 cc. of a 1 per cent solution of sulfanilamide. The same protection could be produced when the mice were fed 15 to 25 mg. of sulfanilamide by gavage.

TABLE 1. *Classification of Patients.*

TYPE OF TREATMENT	NO. OF CASES	RACE		DISEASE		
		WHITE	NEGRO	ACUTE	CHRONIC	AVERAGE DURATION
						days
Sulfanilamide	100	51	49	85	15	5.0
Sulfanilamide and vitamin C	23	6	17	23	0	15.2
Sulfanilamide and vaccine	43	19	24	34	9	26.5

Our first study[6] was based on 100 patients, in all of whom a diagnosis of gonorrhea had been made on clinical evidence, positive smear and positive culture. The types of patients treated are shown in Table 1.

The method of treatment used for adults was to administer 80 gr. (5.2 gm.) of sulfanilamide‖ every twenty-four hours in four divided doses for the first four days, and 40 gr. (2.6 gm.) for the next seven days. The fluid intake was limited to 1000 cc. a day. No other treatment was given.

Approximately 25 per cent of the patients showed toxic manifestations as a result of the administration of the drug. These included dizziness, diarrhea, nausea, rash, fever, tingling sensation of the extremities, dyspnea and palpitation and occasionally general depression. No patient experienced marked or acute anemia.

The criteria of cure used were the absence of symptoms and signs; repeated negative smears and cultures from the urethra, cervix, prostatic secretion and urinary shreds; provocative instillation of silver nitrate; passage of sounds in men; the drinking of alcoholic liquor, followed by negative smears and cultures. The final step was permission for protected sex contact, with subsequent negative smears and culture examina-

*From the Social Hygiene Clinics of the Department of Health of the City of New York. Read at the meeting of the Neisserian Medical Society of Massachusetts, Boston, November 16, 1938.

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‖The sulfanilamide (Prontylin) used in this study was supplied through the courtesy of the Department of Medical Research, Winthrop Chemical Company, New York City.

tions. The investigation was carried out in successive steps, each one being successfully passed before the next was instituted. The results obtained in this first group of patients are indicated in Table 2.

TABLE 2. *Results of Treatment.*

TYPE OF TREATMENT	NO. OF CASES	CURED	PER CENT
Sulfanilamide	100	45	45
Sulfanilamide and vitamin C	23	11	48
Sulfanilamide and vaccine	43	35	81

Concentration of sulfanilamide in the blood in this group showed no constant relation to the results obtained. The highest concentration found was 12.2 mg. per 100 cc. after the patient had taken 160 gr. (10.4 gm.) in three days and 80 gr. (5.2 gm.) in the twenty-four-hour period preceding determination. The lowest concentration was 1.5 mg. per 100 cc., found after 80 gr. had been taken in a twenty-four-hour period. Sulfanilamide disappeared from the blood stream in an average of five days after the cessation of its administration. The longest time that the drug remained in the blood stream was twelve days after discontinuance. In patients who failed to respond after a four-day interval, increasing the dosage even up to 140 gr. (9.1 gm.) per day had no additional effect on the progress of the disease. The details in the cases successfully treated are shown in Table 3.

TABLE 3. *Data in Cases Successfully Treated.*

DATA	SULFANILAMIDE	SULFANILAMIDE AND VITAMIN C		SULFANILAMIDE AND VACCINE	
		SULFANILAMIDE	VITAMIN C	SULFANILAMIDE	VACCINE
Total dose	*gm.*	*gm.*	*gm.*	*gm.*	*cc.*
Lowest	6.0	9.3	0.2	0.7	0.02
Highest	115.0	40.0	1.5	40.0	3.22
Average	36.0	35.8	1.4	12.4	0.65
Negative smear	*days*	*days*		*days*	
Lowest	1.0	2.0		2.0	
Highest	25.0	18.0		51.0	
Average	4.6	5.2		11.8	
	gm.	*gm.*	*gm.*	*gm.*	*cc.*
Average dose before smear became negative	11.3	20.1	0.51	9.2	0.3
Negative culture	*days*				
Lowest	1.0				
Highest	28.0				
Average	4.9				
Disappearance of discharge	*days*	*days*		*days*	
Lowest	1.0	7.0		5.0	
Highest	14.0	14.0		54.0	
Average	4.0	11.0		19.3	
Negative urine		*days*		*days*	
Lowest		7.0		2.0	
Highest		46.0		57.0	
Average		12.1		17.7	
	days	*days*		*days*	
Average time for cure	13.7	11.0		19.3	

In surveying the results obtained with this first group of patients, the low percentage of those apparently cured suggested that the number of cases might be increased by supplementing sulfanilamide with some modality which would increase the response of the patient or enhance the bactericidal or bacteriostatic effect of sulfanilamide.

In order to investigate this possibility, a group of patients were treated with a combination of sulfanilamide and vitamin C.* The use of vitamin C was suggested by the results reported by Jusatz[7] in increasing the specific antibody production in animals by the intravenous administration of this vitamin. The method of treatment was to add to the sulfanilamide as given in the preceding group of patients vitamin C intravenously every other day, starting with 100 mg. and increasing by 100 mg. until a maximum of 300 mg. had been reached. Another small series of patients, in whom smaller doses of sulfanilamide were given together with smaller doses of vitamin C, responded in approximately the same time as those receiving the larger doses.

Another group was treated with a combination of sulfanilamide and gonococcal vaccine. It was thought that the addition of the vaccine might increase the antibody production and so enhance the effectiveness of sulfanilamide. The patients received an initial test dose, intradermally, of .01 cc. of the vaccine containing 5,000,000,000 gonococci per cubic centimeter. If the area of erythema did not exceed 5 cm. in diameter, an initial dose of .05 cc. of vaccine was given subcutaneously in the mid-region of the anterior thigh. The amount was increased by .05 cc. at biweekly intervals. In some cases the dosage was increased to a maximum of 1.0 cc.; in others the increase in vaccine was continued beyond this point. In the former cases the amount of sulfanilamide administered was the same as in those receiving sulfanilamide alone. Where the dosage of vaccine was carried beyond 1.0 cc., 5 gr. of sulfanilamide per day was administered. (See Tables 2 and 3.)

DISCUSSION

In comparing the cases treated with sulfanilamide alone and those treated with combinations of sulfanilamide and vaccine or vitamin C, it appears that in the latter group the amount of sulfanilamide required to produce effective results was considerably less. The advantage of combination is shown in the very much lower incidence of reactions to sulfanilamide necessitating discontinuance. The percentage of such reactions was only 14 per cent in the cases receiving full doses of sulfanilamide and vitamin C and 11 per cent in those receiving sulfanilamide and vaccine, as

*The vitamin C (Cebione) used in this study was supplied through the courtesy of Merck and Company, Incorporated, Rahway, New Jersey.

compared with approximately 25 per cent in those receiving sulfanilamide alone in equivalent doses. In the cases in which the dosage of sulfanilamide was reduced, it caused no reaction.

The decrease in the dosage of sulfanilamide in cases treated with combinations of the drug with vitamin C or vaccine apparently had no adverse effect on the time required to effect a cure. The average time required in the cases treated with sulfanilamide and vitamin C was 11.0 days, as compared with 13.7 days in those treated with sulfanilamide alone and 19.3 days in those treated with sulfanilamide and vaccine. During the administration of vaccine, however, patients were frequently left untreated for a week or more, in order that the full measure of vaccine action might be utilized before continuing the treatment. These rests are responsible for the apparent increase in the time required for treatment.

Further experiments are being continued in an attempt to ascertain the optimum dosage of sulfanilamide in combination with vitamin C or with vaccine. It is of course quite possible that some other modality as adjuvant treatment will prove more efficient than either of those here indicated. From the trend of our results in a limited group of patients it appears probable that some type of treatment combined with sulfanilamide will make the latter drug more effective.

It is also possible that other preparations of the sulfonamides will be elaborated which are less toxic and more efficient in treatment. Such preparations are in existence, and we may be able to evaluate some of them in the near future.

SUMMARY AND CONCLUSIONS

One hundred patients with gonorrhea were treated with sulfanilamide alone, 45 per cent of whom were cured in an average of 13.7 days.

Twenty-three patients were treated with sulfanilamide and vitamin C, of whom 48 per cent were cured in an average of 11.0 days.

Forty-three patients were treated with a combination of sulfanilamide and gonococcal vaccine, of whom 81 per cent were cured in an average of 19.3 days.

It appears from the figures reported in this study that to enhance the action of sulfanilamide by adjuvant therapy, which either increases the antibody formation or increases the efficiency of sulfanilamide, is a promising method of treatment. Further studies along this or related lines will be needed before more precise information becomes available.

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REPORT ON MEDICAL PROGRESS

NEUROLOGY

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A NUMBER of new procedures, in both diagnosis and treatment, mark recent progress in neurology, some of which should find a place in next year's report. The present discussion concerns work dating farther back than a year which seems to be of established value. To be sure, some of the subjects reviewed have been treated in part by writers in allied fields, but this fact makes it all the more likely that the subjects so treated are worth while.

ELECTROENCEPHALOGRAPHY

During the last few years the study of "brain waves" has been increasing rapidly in many laboratories of physiology. The number of papers on this subject has multiplied to such an extent as to occupy nearly half the space of the newly founded *Journal of Neurophysiology*. But only recently has this work become of clinical significance, and its range of dependability is still a matter for study. According to Walter[1] there are two types of waves possessing clinical significance: alpha waves of ten-second intervals, which are a constant product of the brain, and may be influenced by many psychological, physical and chemical stimuli, and delta waves of slower rhythm, which appear to be the product of a disordered cortex. In epilepsy, both grand mal and petit mal, a disordered rate of production of waves, with injection of spikes, is now recognized as so characteristic that in a doubtful case the diagnosis is generally considered as proved by this finding. Basing their conclusions on the electroencephalogram, Gibbs, Gibbs and Lennox[2] speak of epilepsy as "paroxysmal cerebral dysrhythmia."

Localization of cerebral lesions is now made possible by the electroencephalogram, and extraordinarily accurate localization has been accomplished, as shown by Williams and Gibbs.[3] At this time it seems that exact localization is to be expected in tumors in or near the cortex, with less accuracy for other types of pathologic lesions and for deep tumors. Thus we have come to rely most on electroencephalography in confirmation of cortical tumors, and on pneumoencephalography in cases of supposedly deep tumors. With the impetus well started, it is likely that electroencephalographic reports will soon become routine in the analysis of difficult brain cases.

Correlation of the electrical potential of the brain with body and mind types would seem unreasonable, but work in progress suggests that there are different rhythms corresponding with phlegmatic and with exuberant personalities. The brain waves of identical twins are found to resemble each other closely.

DILANTIN IN EPILEPSY

By a painstaking and systematic study on dogs in which convulsions were produced by a known amount of a convulsant drug, Merritt and Putnam[4] were able to study the comparative preventive effects of a large number of drugs. Analysis showed that a barbiturate, sodium diphenyl hydantoinate (Dilantin), discarded by one of the large pharmaceutical houses as a poor hypnotic, was a more effectual anti-convulsant than phenobarbital. A large number of patients have been treated by Merritt and Putnam and by others with most encouraging results. No ill effects other than dermatitis are reported by these investigators. Dilantin seems already to have taken its place as a most useful drug in prevention of convulsions, but reports of its use over a long period of time must be awaited for full appraisement.*

DISORDERS OF MUSCLE

Three diseases, or more properly physiologic disorders, of muscle have recently been brought under partial control by medical means. These are myasthenia gravis, myotonia congenita and familial periodic paralysis.

Myasthenia gravis was until 1930 treated chiefly by rest. In that year Edgeworth observed in her own case that fatigability was greatly reduced by ephedrine. In 1934 Walker used Prostigmin hypodermically with success. It is now possible, by judicious employment of Prostigmin orally, to re-

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*In the program for the June, 1939, meeting of the American Neurological Association was a summary of a paper by Merritt and Putnam in which it is stated that 332 patients have now been treated with Dilantin and that this drug has been more effective in 79 per cent of the cases than treatment by previous methods, whereas only 2 per cent of patients treated by older methods did better than under Dilantin. They also report: "On the whole, patients have tolerated the drug very well and have stated that they felt better than on any other form of treatment. This was particularly true when relief of attacks was obtained. Certain toxic reactions to the drug were encountered, chiefly in the gastrointestinal tract, the gums, the skin and the central nervous system."

store to apparent health a certain number of persons rendered helpless by myasthenia. Each patient must be studied for the correct amount and required frequency of the drug, an average, according to Viets et al.,[5] being 15 mg. eight times daily. Studies are under way which are designed to lessen the frequency of medication and render the treatment less expensive. Two such variations in treatment have been tried with success. Potassium given with Prostigmin has in some cases given better results than Prostigmin alone, and Lanari[6] has used Prostigmin in oil by injection, and has found a longer effect than that obtained with aqueous solutions.

Viets and Mitchell[7] have elaborated the "Prostigmin test," and advocate it for suspected cases of this disorder. They list a number of diseases simulating myasthenia which under the conditions of the test show no benefit from the injection. Noteworthy as refractory to the therapeutic test are progressive muscular dystrophies and the myasthenia of pregnancy (Fekete[8]). I have encountered alarming symptoms in a case of progressive bulbar palsy.

Myotonia congenita (Thomsen's disease) is a rare disturbance, familial in character, in which the exercise of muscle function results in temporary paralysis. Both upper and lower extremities are affected, although the symptoms are most frequently observed in the hands, which on repeated clasping remain cramped and cannot be relaxed for several seconds. No pathologic lesion has been described, and as in the case of myasthenia gravis the neuromuscular junction is thought to be the vulnerable locus of disordered physiology. But in myotonia, in contradistinction to myasthenia, Prostigmin increases the symptoms. Kennedy and Wolf[9] have found that quinine is effective in preventing the muscular spasm of this disease. Large doses must usually be given, 5 gr. of quinine hydrochloride three times or more daily often being necessary. Unfortunately, the amount of quinine required may not be tolerated by the patient, as in a case of my own now under treatment. Kennedy and Wolf emphasize the pharmacologic antagonism of myasthenia and myotonia, Prostigmin benefiting the former and exaggerating the symptoms of the latter, and quinine increasing the weakness of myasthenia while relieving the spasm of myotonia. The reciprocal action of these drugs has been confirmed by other observers and by me. Further study of these and other drugs is necessary for a better understanding of the method by which they act, and a paper by Kolb et al.[10] attempts to do this.

Familial periodic paralysis is a rare disease in which generalized flaccid paralysis comes on without warning, generally during sleep. The muscles are unexcitable by electricity but do not waste, and reflexes are lost. When the paralysis disappears in a few hours or days, function is completely restored. As indicated by its name, the disease appears to be hereditary.

Through the observations of Herrington,[11] Aitken et al.,[12] Gammon[13] and Pudenz et al.,[14] it seems certain that some disorder of potassium metabolism is at fault. All these investigators agree that the paralysis can be promptly overcome by the administration of potassium. It has also been shown that glucose tends to produce paralysis. In my own single case, 100 gm. of glucose given by mouth brought on paralysis. The potassium concentration in a normal state was 4.3 milliequivalents per liter, but fell to 2.6 milliequivalents during an attack. The patient was given 2 gm. of potassium chloride by mouth daily, and during the next six months had only one attack, presumably caused by eating candy.

There is also uncertainty in this disease as to where and how the potassium radical works. In myotonia and myasthenia the neuromuscular junction appears to be the vulnerable point. In familial periodic paralysis, however, the investigations of Pudenz et al.[14] tend to exonerate it. No satisfactory explanation as to the effect of the potassium radical has yet appeared.

PITUITARY ADENOMAS

While the surgical treatment of tumors of the pituitary gland has generally been accepted as the best, some doubt has been cast on it by advocates of x-ray therapy. Perhaps the most reliable advocates of the latter are Hare and Dyke,[15] who report improvement or stationary vision in 76 per cent of patients with chromophil adenoma, and in 53 per cent of those with chromophobe adenoma. The recent report of Henderson,[16] based on a study of 338 cases from Cushing's series, does not answer the question of preference, as would be expected from a surgical clinic, but his conclusions strongly indicate that surgery plus x-ray therapy is more effective than x-ray alone. He writes:

> Only 32.8 per cent of patients after trans-sphenoidal operation alone failed to show evidence of symptomatic recurrence at the end of five years; this was increased to 65.3 per cent for those who had x-ray therapy in addition. Of the patients who had a transfrontal operation alone, 57.5 per cent remained free from recurrence at the end of five years, and this was increased to 87.1 per cent for those who had transfrontal operation plus x-ray therapy.

Henderson quite rightly states that advocates of x-ray therapy alone cannot yet report on long-range observation. So while it is apparent that x-ray alone is effective, we must admit that, in the hands of Cushing, combined operation and x-ray is probably best; further, it is generally agreed that, if under x-ray treatment blindness progresses, no time should be wasted in advising operation.

MÉNIÈRE'S DISEASE

Two methods of treatment for this crippling malady have emerged in the last few years. Surgical treatment, as elaborated by Dandy, is still the best-known procedure and that most certain to produce good results. This operation as now performed is selective in that the auditory fibers are left to function, and deafness is not a sequela.

In 1934 Furstenberg et al.[17] advocated a diet low in salt and high in ammonium chloride. The theory behind their successful treatment was based on the assumption of a disordered sodium metabolism. Talbott et al.[18] have put this theory to chemical test, and conclude that "neither alkalosis, hydration nor a high sodium intake is associated with the pathogenesis of Ménière's disease." They find that potassium chloride, 6 gm. in a 25 per cent solution, given daily by ingestion, produces results equal to those of the Furstenberg regime. No restriction of salt in the diet is required.

VITAMIN DEFICIENCY

More than ten years ago Shattuck[19] called attention to the close relation of alcoholic polyneuritis to beriberi. At that time it was widely taught that there were two varieties of neuritis, that due to exogenous poisons such as alcohol, lead, arsenic and so forth, and that due to endogenous toxins, diabetes, infections and so forth.

During the last decade there has been a tendency to bring all the neuritides under a single pathogenesis, for example vitamin B_1 deficiency, and this point of view is expressed in a recent paper by Shattuck.[20] Not only are neuritides so explained, but also a number of myelopathies and cranial nerve disorders. Lewy[21] fully accepts this point of view, and attempts to explain the underlying difficulty as one of liver deficiency. He states: "As soon as more than one third of the mobile vitamin B stock of the liver has been exhausted, the fixed depot of the nervous system begins to decrease. At this moment the first nervous symptoms appear."

It is often a satisfaction to find one cause for so many similar and dissimilar conditions, and one must admit experimental evidence also as proving the importance of vitamin B_1 deficiency in disorders of the nervous system. However pleasing the analogy, it is unfortunately true that treatment along the lines indicated yields variable and often most unsatisfactory results. It has been my experience that not all so-called "deficiency neuropathies" yield equally well to treatment with vitamin B.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 25291

PRESENTATION OF CASE

A seventy-year-old white woman was admitted complaining of cough, dyspnea, choking spells and a sense of oppression in the right upper chest.

As a child she had had acute osteomyelitis in the left tibia. Twelve years prior to admission she had had an attack of phlebitis in the left leg. She was seen by a cardiologist two years later (ten years prior to admission) because of easy fatigue, and he stated that she did not have any evidence of cardiac disease. He made a diagnosis of myasthenia, and she was given suprarenal extract for some time. Eight years before entry her blood pressure was 215 systolic, 105 diastolic. It was thought at this time that she had some emphysema. One year later she began taking nitroglycerin and aminophyllin frequently because it was thought that she showed evidence of vascular spasm. She had no anginal symptoms. Four years before admission the cardiologist made a diagnosis of slight hypertensive heart disease. Her blood pressure was 180 systolic, 95 diastolic. A basal systolic murmur was heard the following year. The blood pressure was 190 systolic, 95 diastolic. She was given aminophyllin and Nembutal. Seven months prior to admission her blood pressure was 165 systolic, 95 diastolic. An electrocardiogram was normal, and she was said to be in good condition. Three months before entry, while working in her garden, she had rather an abrupt onset of a feeling of congestion in the chest (? "wheezy") and a troublesome non-productive cough. The latter persisted and was worse on exertion. She was also quite short of breath on exertion and required three pillows at night. One month later she had three rather painful episodes of mid-substernal oppression only partially relieved by nitroglycerin. The last episode lasted about fifteen minutes. Examination at that time showed no congestion of the cervical veins, lungs or liver and no edema. P_2 was not especially loud. The heart was regular, at a rate of 94 with an occasional premature beat. The sounds were normal. The blood pressure was 160 systolic, 85 diastolic. An electrocardiogram showed flat T waves. She was given Urginin because digitalis had upset her in the past. This drug was discontinued shortly after it was begun, and she resumed the use of aminophyllin and luminal. Two months before entry she again became "wheezy" and uncomfortable. Examination showed a full right jugular vein and slight pitting edema of the shins. P_2 was not loud, but the lungs were "wheezy." An electrocardiogram showed slight T-wave inversion in Leads 1 and 2. X-ray examination at this time showed a normal diaphragm. The left costophrenic angle was hazy, the right obliterated. There were mottled areas of density over the left lower and the greater portion of the right lung field. This mottling appeared to be composed of small irregular fleck-like consolidations with normally aerated lung in between. At the left base and the right mid-lung field there were confluent areas of density up to 4 cm. in length and about 2 cm. in width. The lateral view showed that the areas of density on the right side occupied the anterior margin of the right upper and the apex of the right middle lobe. These shadows were sharp in outline and triangular in shape. The interlobar pleura was moderately thickened. The right lung root was obscured by irregular density. There were no masses in the upper mediastinum or at the left lung root. The heart was grossly enlarged, the enlargement being chiefly in the region of the left ventricle. The total transverse diameter of the heart was 16.2 cm., and the internal diameter of the chest 26.2 cm. One week before entry she had a severe pain in the upper sternum coming through from the back and not going down the arm. Her cough was paroxysmal, dry, persistent and very bothersome. At times she struggled to get her breath. She had lost a small amount of weight, though her appetite had remained fairly good. Her temperature at times rose to 101°F. in the evening. During the next few weeks she began to notice a sense of oppression in the right chest, but no acute pain. Three days before entry, for the first time she began to have tenderness in the veins over the left lower leg. She also developed pains in the lower part of the sternum and in the back, which were slowly relieved in an hour with three tablets of nitroglycerin. They seemed to be helped more by an electric pad. For the previous three or four weeks she had had dyspnea, dry cough and very distressing choking spells. The day before entry she had a fainting spell and marked dyspnea.

Physical examination showed a well-developed and nourished woman with dyspnea, cough and choking attacks. There were diminished breath sounds in the right upper anterior chest and wheezes suggestive of bronchial pressure or obstruction. The heart was slightly enlarged. The blood pressure was 170 systolic, 85 diastolic. There

was some tenderness of the veins about the right internal malleolus. The left leg was moderately swollen. There were no other significant physical findings.

The temperature was 99.1°F., the pulse 80, and the respirations 24.

Examination of the urine was negative. X-ray films of the chest showed a marked change in the right side of the chest since the last examination. The density at the right lung root appeared as a dense triangular area of consolidation occupying the medial aspect of the right upper lobe. The base of the right upper lobe was slightly pushed upward, but the trachea was normal in position. The diaphragm remained at the same level, but both costophrenic angles were obliterated. The fleck-like areas of consolidation scattered through the right lung appeared larger. In some areas they were round. The left upper lobe remained the same. The size of the heart could not be definitely determined because the film was not taken at 7 feet, but it appeared that the heart was larger. There were areas of consolidation which obscured the right border of the heart. These were fairly sharp in outline.

Her condition remained about the same until the seventh hospital day when she developed increasing dyspnea and cyanosis. She was put in an oxygen tent at 7 p. m. and improved. Seven hours later her dyspnea and cyanosis suddenly increased and she had choking attacks. Her condition became rapidly worse, and she died at noon on the eighth hospital day.

Differential Diagnosis

Dr. Maurice C. Pincoffs:* The most significant facts about this case in my opinion are the occurrence in an elderly woman of areas of consolidation in the lungs — some considerable in size and others small and described as fleck-like — and the persistence of these areas over a period of many weeks and their probable increase in size in successive films.

These lesions were associated, it is true, with many symptoms that are a little difficult to interpret. The onset of the illness was sudden, with an attack of dyspnea, and later there were numerous attacks of sudden dyspnea and of faintness. The lesions in the lungs, or some of them, were described as wedge-shaped. So that there are a number of features that suggest multiple emboli with pulmonary infarctions.

Pulmonary infarctions may be cardiac in origin. This patient had been known as a fairly well-compensated hypertensive individual. With the onset of her last illness she found herself more dyspneic on exertion and began to require three pillows for sleep. A silent coronary thrombosis might be suggested, with mural thrombi from which the emboli arose. But there are no other definite supporting data to implicate the heart.

A more obvious source of emboli would seem to be the swollen left leg. There is a history of osteomyelitis in the left tibia as a child, of an attack of phlebitis in this leg twelve years later and of a return of pain and swelling in the leg at about the time of this last admission. One wonders then whether there was a hidden phlebitis deep in that leg, — or in both legs since both were painful, — which might have been the source of these emboli.

Several things, however, lead me away from the idea that this was an ordinary instance of pulmonary embolism from phlebitis. The frequency and the character of the attacks are against it; the many small areas of lung involvement are against it; the long persistence of these areas in successive x-ray films and especially the increase in size of these areas are even more against it.

I believe that in this case the difficulties were caused by metastatic growths in the lung. I do not believe one need divorce the question of embolism from that of malignancy. It is true that the average metastatic growth in the lung develops insidiously, often with no symptoms at all, that it is large and round as a rule and is found pretty well out in the parenchyma, although it may well be near the hilum. But from time to time, gross tumor emboli lodge in the lung causing occlusive changes in smaller vessels. This is another type of tumor invasion of the lung. Might it be that we were seeing something of this latter kind in this case, and that the clinical episodes came on with abruptness because they were due to gross particles of tumor embolizing the lung — as opposed to the usual microscopic tumor metastases which grow silently and start without any evidence of shock? If one had widely scattered areas of that kind one might have wheeze, dyspnea and paroxysmal cough from those which were nearer to the large bronchi and caused local bronchial irritation. I think it is possible at least to fit the data into such a picture without stretching the facts too much.

If this was malignant disease, one should not omit discussion of the possibility that it was a primary bronchiogenic carcinoma with secondary invasion of the lung. There was no evidence of bronchial stenosis. The lesions were very widely spread and apparently changed rapidly in character. The suddenness of clinical onset also would be unusual in bronchiogenic carcinoma. The pains

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in the legs and the swollen left lower leg are left unexplained.

On the other hand, if one leans toward believing that the primary lesion was not in the lung, one would be led to examine the pelvis carefully to see whether it was there. A mass in the pelvis might cause pain in the legs, and by pressure or invasion might obstruct the venous return from the left leg and so cause edema of this extremity. Both ovarian and cervical new growths metastasize to the lungs not infrequently. I have seen a large ovarian carcinoma lead to many tumor emboli in lung vessels.

However, we have not enough evidence to warrant the diagnosis of a primary pelvic tumor. I do wish to commit myself, however, to the diagnosis of a metastatic malignant growth in the lung, and I believe that the lesions in the lung were disseminated through the pulmonary artery rather than by other channels.

Dr. Tracy B. Mallory: Would you like to see the x-rays?

Dr. Pincoffs: I should like to very much.

Dr. Richard Schatzki: I know the answer and therefore shall proceed a little carefully. This is the first film taken in November. I shall confine myself more or less to the hanging up of the films, because the written description covers adequately what is visible on them. These are the films taken at the second admission. The striking thing, which is probably not quite so obvious in the report, is the preponderance of disease on the right side, particularly in the region of the right upper lobe. The bronchial tree is very poorly visible in these films.

Dr. J. H. Means: What does Dr. Schatzki say about the striking difference in luminosity in the last film?

Dr. Schatzki: It is mainly due to the fact that the left side shows fewer lesions than does the right. The right upper lobe is more involved, but the whole right lung is extensively infiltrated by the process.

Dr. Means: Not pneumothorax?

Dr. Schatzki: No; there is air in the lung.

Dr. Pincoffs: I shall adhere to my diagnosis of metastatic growths in the lung.

Dr. Donald S. King: When I first saw this patient she was complaining of the very troublesome cough, and the X-Ray Department had made a diagnosis of multiple infarcts and not cancer. She had had recurrent phlebitis, and we assumed that this was the source of the pulmonary emboli. As the weeks went on there were severe choking attacks and a sense of oppression in the right upper chest in front. I was impressed by the fact that the physical signs in the chest were more like those produced by bronchial obstruction than by infarct, but when true phlebitis and thrombosis developed in the leg it became more difficult to maintain the diagnosis of cancer and I finally gave it up. In the final x-ray film we focused our attention on the large lesions which had the size, shape and location typical of infarcts and paid too little attention to the miliary lesions. In reviewing the films it is evident that these small shadows were present in the first film and had increased in size by the time the last film was taken. The x-ray reports as given in this summary are not those which appear in the record but are reinterpretations in the light of the autopsy.

Clinical Diagnoses

Pulmonary infarcts.
Phlebitis.

Dr. Pincoffs's Diagnosis

Carcinoma of the lung (metastatic).

Anatomical Diagnoses

Colloid adenocarcinoma, bronchiogenic, of the lung, with metastases to lung, bronchial nodes, adrenal glands and pericardium.
Scirrhous carcinoma of breast.
Thrombosis of iliac veins and inferior vena cava.
Hydrothorax, bilateral.
Hydrohemopericardium.
Operative scars: drainage of osteomyelitis of left tibia.

Pathological Discussion

Dr. Mallory: Dr. Pincoffs's diagnosis is essentially the one we made on this case, at the end of a very puzzling autopsy. Later, as you will see, we were forced to revise our opinions. It was evident as soon as we opened the thorax that the pleural surfaces on both sides were studded with small carcinomatous nodules and that there was extensive cancer throughout the lungs. The pericardium was greatly dilated and contained 500 cc. turbid fluid, and its surfaces showed diffuse carcinomatous involvement, so I think it is reasonable to suppose that many of the circulatory symptoms might be referable to the marked involvement of the pericardium. The heart itself, so far as we could make out, was normal. It weighed 275 gm. The cavities were normal in size; the valves were negative. The coronaries showed atheroma. The distribution of the tumor nodules diffusely over both pleurae and throughout both lungs looked like metastatic tumor, and an extensive search was made for the primary focus, which till the end of the autopsy seemed fruitless. We could find nothing anywhere. At

the beginning of the autopsy I had carefully palpated the breasts and felt nothing, but on cutting into the left breast from beneath I finally discovered a perfectly characteristic small scirrhous carcinoma about 1.5 cm. in diameter. The main difficulties with accepting it as the primary source were that the axillary nodes on that side were entirely negative and that it was a relatively small tumor. I had already opened up the major bronchi and a good many of the minor ones, thinking of the possibility of primary bronchiogenic carcinoma, without being able to satisfy myself that any of the tumor nodules suggested it. We found a massive phlebitis of both iliac veins and of the inferior 2 cm. of the vena cava, but there had been no emboli so far as we could make out. There was one area of infarction in the lung, but the corresponding vessel seemed to be occluded by tumor, not by thrombus, which we thought was due to invasion of the vessel, locally, rather than to embolism.

When the microscopic sections came through, the breast tumor was an undifferentiated scirrhous carcinoma but the tumor in the lungs, pericardium and pleurae was a very well differentiated mucoid adenocarcinoma. It seemed impossible that such an undifferentiated breast tumor could have given rise to secondary deposits which showed large glands forming abundant mucus. So we then went back to the lungs and finally found a bronchus in the right middle lobe which was completely surrounded by tumor. Sections through that showed involvement of all layers of the bronchial wall and I think a perfectly characteristic picture of primary adenocarcinoma of the bronchus. Such a tumor can be mucoid in character. So our final decision on this case is that the primary disease was bronchiogenic carcinoma and that she also had a second entirely independent and unimportant carcinoma of the breast.

Dr. Schatzki: In what lobe was the vessel which was obstructed by tumor?

Dr. Mallory: It was in the lower part of the right upper lobe.

Dr. F. Dennette Adams: As a matter of warning against blindly accepting the roentgenologist's opinion in the future, was the triangular mass collapse or tumor?

Dr. Mallory: There were two major foci of tumor, one in the middle lobe and one in the upper lobe, the one in the middle lobe being the primary one.

A Physician: There was no evidence of tumor's infiltrating into the blood vessels?

Dr. Mallory: I assume there must have been to explain the distribution. One does see this distribution, not commonly but infrequently, in the later stages of bronchiogenic carcinoma.

Dr. Schatzki: In order to warn you still more, Dr. Adams, the man who did the interpretation showed us the films after the outcome was known. I think we all fell down flatly on the first films. It was not a characteristic picture. The last films should have been more suggestive of carcinoma.

CASE 25292

Presentation of Case

First Admission: A fifty-one-year-old traveling salesman entered the hospital with the complaint of swelling of the upper half of his body.

He had been in the best of health until four years before entry when he developed four or five superficial, localized abscesses on his legs and back. These finally ruptured and healed completely. Seven months later he developed a "Brodie's abscess" in the right tibia near the ankle joint, which was drained but failed to heal. Three years before entry the anterior and part of the lateral cortex of the lower third of the tibia were removed with two sequestrums. In spite of this and the use of various kinds of dressings the lesion still continued to drain up to the time of entry. Quite suddenly, about one month before entry, he noticed swelling of his face, neck, arms and chest with puffiness of his eyes and dilatation of the veins of his chest down to the costal margins. When he lay down the upper part of his body became hot and flushed. He also had severe pain on motion in the biceps muscles of his arms. He had a slight cough but no dysphagia, and no other pains. He was thought to have enlarged mediastinal nodes, and over a period of two and a half weeks was given eight x-ray treatments to the chest. However, they failed to improve his condition, and the symptoms and signs persisted up to the time of entry. Two weeks before entry he developed a boil on the end of his nose which failed to heal. During the month before entry he had been easily fatigued and had noticed some weight loss. He had had no fever, night sweats, chills or any gastrointestinal or genitourinary symptoms.

His wife and one child were living and well. One child had died of miliary tuberculosis. His family history was otherwise negative.

Physical examination revealed an apparently healthy, well-developed, fairly well-nourished man. His body appeared to be somewhat flushed and thick set above the waist and definitely paler and thinner below. There was fullness of the supraclavicular and infraclavicular fossae and interspaces, with dilated veins on the upper part of the

chest. In the recumbent position the upper half of his body became flushed and slightly cyanotic, and the chest and neck veins stood out very prominently. The blood pressure in the left arm was 150 systolic, 95 diastolic, and in the right arm 125 systolic, 90 diastolic. The trachea was in normal position and no abnormal pulsations could be seen. There was questionable increase in mediastinal dullness. Breath sounds and tactile and vocal fremitus were somewhat decreased over the upper half of the chest but normal in the lower half. The heart was not enlarged, the sounds were normal, and no murmurs could be heard. The abdomen was negative. A few shotty nodes could be palpated in the inguinal region but none elsewhere. On the tip of the nose there was a verrucous, non-tender lesion measuring 1 cm. in diameter, with an inflamed base. There was a similar lesion over the body of the first dorsal vertebra; and there were healed scars over the sacrum, inguinal region and calf of the left leg which were said to have followed boils. Embedded in the calf of the left leg was a very firm, non-tender nodule about 3 by 2 cm. which was located just above the scar in that region. Over the lower end of the right tibia was an open gutter-type incision, about 15 cm. in length, which did not involve the joint. It was lined with granulation tissue and was draining foul-smelling material.

The temperature was 99°F., the pulse 110, and the respirations 20.

The urine had a specific gravity of 1.010 and contained a slight trace of albumin and many bacteria. The blood showed a red-cell count of 4,060,000 with 75 per cent hemoglobin, and a white-cell count of 11,900 with 86 per cent polymorphonuclears, 5 per cent lymphocytes, 6 per cent monocytes and 2 per cent eosinophils. Two blood Hinton tests and a Wassermann test were negative. The serum protein was 6.4 gm. per 100 cc. A blood culture gave no growth and a Frei test was negative. The stool examination was negative. An electrocardiogram was within normal limits.

An x-ray film of the chest showed the diaphragm to be normal in outline. It was rather low in position and moved well with respiration. There was fine diffuse linear mottling consistent with pulmonary fibrosis. No large areas of consolidation were seen, and there were no mediastinal masses. The aorta showed an extreme degree of tortuosity which was apparently exaggerated by lateral curvature of the spine. It seemed to cross from the left to the right side of the spine at the level of the tenth dorsal vertebra, but it was not dilated and there was no appreciable degree of calcification. The heart was normal in size and shape, and the trachea showed no displacement or deformity. A plain x-ray film of the abdomen showed no abnormalities, and a film of the nodule embedded in the left calf showed no calcium in it.

His condition remained essentially unchanged for the first week. On the eighth day it was thought by one observer that the edge of the spleen and several nodes in both axillas had become palpable. He was discharged on the nineteenth day, essentially unimproved.

Final Admission (six weeks later). Soon after discharge he began to have severe almost constant headaches, which persisted up to the time of re-entry. During the two days before re-entry he complained less of the headaches, but his wife noticed that he was mentally disoriented, with a tendency toward euphoria and drowsiness. During the interval between entries the swelling of the upper part of his body had greatly diminished.

The general physical examination was essentially unchanged except that the edema of the upper part of the body and the dilatation of the veins of the chest had largely disappeared. The liver edge was slightly tender and palpable three fingerbreadths below the costal margin. He was disoriented and definitely confused. There was slight stiffness on flexion of the neck, and suggestively positive Brudzinski and Kernig signs. There was slight limitation of forward flexion of the spine, and distinct tenderness to percussion over the dorsolumbar spine from the seventh dorsal vertebra to the sacrum. No definite abnormalities of the cranial nerves could be detected; and no paralysis, paresis or loss of sensation was present elsewhere in the body. The tendon reflexes were active, the left knee jerk being more active than the right. There was a questionably positive Babinski on the left.

The temperature was 100°F., the pulse 105, and the respirations 20.

The urine, blood and stool examinations were essentially the same as on the first entry. A lumbar puncture showed an initial pressure of 425 to 450 mm. of water, with normal pulse and respiratory oscillations. The spinal fluid was moderately turbid and contained 326 polymorphonuclears, 36 lymphocytes and 74 red cells per cubic millimeter. The total protein was 306 mg. per 100 cc., the sugar 34 mg. and the chlorides 627 mg. The gold-sol curve was 4455553320, and the spinal-fluid Wassermann test was negative. No organisms could be seen on smear or cultured from the fluid.

On the third hospital day he became incontinent, but during the next two days became more alert, although he was still very disoriented and confused. A neurological examination on the sixth day showed no marked changes. He no longer

complained of headache, but when asked about it admitted he had a little. A lumbar puncture on the ninth day showed an initial pressure of 300 mm., with normal pulse and respiratory oscillations. The spinal fluid contained 46 polymorphonuclears, 210 lymphocytes, 21 large mononuclear cells and 223 red cells per cubic millimeter. The total protein was 300 mg. per 100 cc., the sugar 49 mg., and the chlorides 645 mg. The goldsol curve was 5555555543. During his course in the hospital his temperature ranged from 99.5 and 102° F. He gradually lapsed into a semistuporous condition and died on the nineteenth day.

Differential Diagnosis

Dr. Wyman Richardson: There is no reason to suppose that the abscesses might not have been ordinary furuncles except that the word "abscess" makes one feel that they had been present a long time. We do not know exactly how long. He developed osteomyelitis and one might attempt to relate the osteomyelitis with a localized skin lesion and might possibly consider a staphylococcal pyemia. At any rate he developed osteomyelitis, which drained and failed to heal, and later several other operations were done with the removal of two sequestrums, a sequence which is not at all strange for this type of osteomyelitis. One might reach the conclusion that this patient showed symptoms of an upper mediastinal mass. The surprising thing, however, is that the relevant history applies exclusively to the circulation. There is no Horner's syndrome, no interference with deglutition, and questionable evidence of difficulty in the arterial circulation of the arms. The pain might have been due to muscular anoxia. It might be nerve pain, but the suggestion is that it was arterial in origin. Whoever saw him outside evidently thought he had a mediastinal mass. After reading the present illness one would still be thinking in terms of cancer, possibly of some lymphoid tumor, and one might also bring up the thought that, since he had osteomyelitis of long duration, cancer had developed in the sinus. Dr. Edward B. Benedict studied some of these cases but found that they were very chronic and that carcinoma developed only after ten to twenty-five years of a constantly draining sinus. This had been going on for only three or four years. We shall leave it at that for the moment — simply pointing out that the only functional disturbance seems to be with the veins and possibly the arteries of the mediastinum. Constrictive pericarditis can, I believe, be eliminated by the absence of evidence of venous obstruction in the lower half of the body.

There is quite a difference here in systolic pressure in the two arms, but my experience in trying to measure pressure on two sides has shown that often one can get quite a difference in the absence of disease.

A verrucous lesion of the nose does not suggest an ordinary boil, does not suggest lupus vulgarus, but one must still think of tuberculosis.

May we see the x-rays?

Dr. George W. Holmes: I cannot add much to what is in the report except to say that I am disturbed about this shadow parallel and lateral to the aorta. It does not seem as if it were directly connected with the aorta. If all he had was a tortuous aorta the curve should be more in that direction. These films were taken in the oblique position in an attempt to bring out the great vessels. He has more tortuosity of the aorta than one would expect in a man of fifty. I do not see anything characteristic in the lungs. The abdominal films do not help. There is no disease of the bone. There is a slight fuzziness of the lung markings throughout the chest.

Dr. Donald S. King: On fluoroscopy they thought that was simply aorta. Dr. Hampton could not find anything else.

Dr. Richardson: The trachea is in the midline?

Dr. Holmes: Yes.

Dr. Richardson: Perhaps we had better go on with the knowledge that there is no definite observable mediastinal mass. If it were a malignant lesion it would seem as if there should be evidence in the x-ray film of distortion of the trachea or of some other lesion to explain the pressure symptoms.

The story on the second admission is that he began to have obvious symptoms of meningitis, — headaches, disorientation, drowsiness, — and the only question is how long it had lasted before he came in. I thought this out as being definitely a chronic meningitis, and physical examination is consistent with meningitis. The most striking feature of the second admission is that all this upper mediastinal trouble we have been talking about has largely disappeared, and that is difficult to explain. We do not know whether the patient had medication or further x-ray. It seems unlikely that the x-ray treatment he had in the beginning was responsible. It is possible that the x-ray treatment caused the melting of some nodes that no longer show on x-ray, but that seems unlikely. He kept getting worse but he had a slight remission in the course of his terminal illness. The second lumbar puncture showed 46 polymorphonuclears, 210 lymphocytes and 21 large mononuclear cells and a sugar of 49 mg. per 100 cc., which is a curious finding.

If we forget about the upper mediastinal situa-

tion we are up against the problem of a patient of fifty-one dying with chronic meningitis. He had one child who died of miliary tuberculosis. I think one perhaps should lead up to a diagnosis of tuberculous meningitis. However, it is unusual for a man to die of tuberculous meningitis without having had evidence of miliary tuberculosis, that is, with tuberculous meningitis as the only terminal symptom. Furthermore, I get the impression that the length of time that the meningitis had lasted was longer than one would expect. There is no evidence of tuberculosis elsewhere, unless the slight fuzziness observed in the x-ray films is evidence of miliary tuberculosis. These were taken at the first admission. I believe that films taken later might have shown a lesion.

Now if we cast about for some other cause of chronic meningitis we are at a loss to know what it could be. We consider syphilis and rule it out because of negative blood tests and a negative Wassermann test on the spinal fluid. As one wanders about the corridors in this hospital one hears rumors about a patient with a yeast-like infection of the meninges, and as one reads over this case one has an idea that this might be the very patient — I strongly suspect he is. I am in a hole because I do not know whether the diagnosis was correct at the time Dr. Sumner M. Roberts mentioned this yeast-like infection of the spinal fluid, but as one tries to figure causes of chronic meningitis one should think of a yeast-like infection and one looks up the literature of torula meningitis. I looked up one article in which 69 patients were reported with this disease. I do not know what torula means and I have no knowledge of the types of yeast organisms, but if I tried to believe that diagnosis and forget the first admission it would explain very well the lymphocytes. They might well have been yeast-like organisms if the smear was not correctly stained, and in fact such cases might have lymphocytes in the spinal fluid.

If we accept that diagnosis, the questions are whether the skin lesions were of the same sort and what was the portal of entry. I think one can say that the later skin lesions were due to fungus, accepting this diagnosis for the moment, and one wonders if the original lesions might have been those of a simple furunculosis, and the portal of entry the sinus that drained so long. Are the lungs involved and can we account for this edema on the basis of fungous infection in the lung? That is going rather far afield. One can imagine an organism's producing a considerable amount of fibrosis that might cause distortion of the softer parts of the mediastinum and possibly interfere with venous return to the heart. That seems improbable to me. On the other hand, how else could we account for this curious picture, and, finally, why did it disappear? Did he get large amounts of iodide and does iodine have any effect in this condition? I cannot answer these questions. Once having entertained the diagnosis of yeast infection it seems to me that it more clearly explains the entire picture than any other diagnosis of which I can think. I shall rule out lymphoid disease and Hodgkin's disease, although there is a slight lymphopenia and I may have ruled them out too quickly. I shall rule out tuberculous meningitis; and aseptic lymphocytic meningitis I also eliminate since such a diagnosis does not explain the entire picture.

Dr. King: This man was sent in with upper mediastinal obstruction, supposedly from lymphoma. He was given x-ray treatment with no effect. Dr. Hampton could not find anything to account for the obstruction. The patient had skin lesions on the nose, also around the osteomyelitic sinus, and it was a biopsy from the skin around the sinus that made the diagnosis. It looked exactly like carcinoma and Dr. E. D. Churchill, who saw the skin lesion around the osteomyelitic wound thought it was carcinoma. After the diagnosis was made from a biopsy of the skin lesion, Dr. Champ Lyons succeeded in growing the organism from the discharge of the osteomyelitic wound.

Dr. Jacob H. Swartz: This case was interesting to me because from a dermatological standpoint it was not typical of blastomycosis. I saw him in consultation, and I noted then that it might be one of three diseases: dermatitis medicamentosa due to bromides or iodides, tuberculosis, possibly the verrucous type, or moniliasis. I did not consider blastomycosis because the clinical picture did not fit into any of the three types of cutaneous lesions usually found, that is, the papuloulcerative, the verrucous or the gummatous.

The microscopic examination of the tissue was the only means of making a diagnosis. The finding of the double-contoured bodies in the giant cells and in the granulomatous tissue ruled out the other possibilities mentioned.

I believe it is in place to mention here that at present the view of the majority is that several species, all of which fall into the classification of fungi imperfecti, may produce the clinical picture which is recognized as blastomycosis.

Clinical Diagnosis

(Before biopsy report.) Lymphoblastoma.

Dr. Richardson's Diagnoses

Yeast-like infection with meningitis and osteomyelitis.
Obstruction of superior vena cava.

Anatomical Diagnoses

Blastomycosis, generalized, with meningitis.
Thrombophlebitis of superior vena cava.
Osteomyelitis, chronic, right tibia.
Prostatitis, chronic.
Psoas abscess, chronic.
Arteriosclerosis, coronary and aortic.

Pathological Discussion

Dr. Tracy B. Mallory: The postmortem on this patient showed why he had had the upper mediastinal syndrome but did not explain why he recovered from it. It looked like a triumph for iodide therapy, but I do not believe it had anything to do with it. He had complete thrombosis of the superior vena cava for a distance of 7 cm. from the auricle upward. The thrombus was apparently just as solid at the time of autopsy as it had been at any previous time. There was no recanalization, and certainly the iodides had not caused resolution of the thrombus. He must have developed a collateral circulation, but we were unable to identify it. Blastomyces were found in small numbers in the thrombus. They were also found in sections through the indurated area in the calf of the leg which was described, and we found them also in the prostate, which was full of abscesses. The lungs were free, and there was no pulmonary fibrosis.

A Physician: The calf lesion was supposed to have been there for four years. Do you suppose blastomyces could have been there all that time?

Dr. Mallory: I think it is quite possible.

A Physician: There are reported cases of blastomycosis in which osteomyelitis appeared two or three years before the involvement of other viscera was recognized.

The New England
Journal of Medicine

Formerly the
Boston Medical and Surgical Journal
Established in 1828

Owned by the Massachusetts Medical Society and Published under the Jurisdiction of the Committee on Publications

Official Organ of
The Massachusetts Medical Society
The New Hampshire Medical Society
The Vermont State Medical Society

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Subscription Terms: $6.00 per year in advance, postage paid, for the United States; Canada, $7.04 per year; $8.52 per year for all foreign countries belonging to the Postal Union.

Material for early publication should be received not later than noon on Saturday.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to the New England Journal of Medicine, 8 Fenway, Boston, Mass.

THE ANNUAL ORATION

The concluding exercise of the 1939 annual meeting of the Massachusetts Medical Society was an oration delivered by Dr. Elliott P. Joslin, who is justly recognized as holding a high position among those who have enabled this commonwealth to maintain a prominent position in the history of medical accomplishments in this country. The text of his paper appears in this issue of the *Journal*.

In this address many of the current social problems interwoven with those pertaining to health, the value of postgraduate instruction, and the importance of health councils and other agencies are presented in dignified and forceful language. His attitude with reference to these subjects is in accord with that of other exponents of the duties and responsibilities of the individual doctor and organized medicine, and is a contribution to testimony on record in support of the contention that the profession can and will solve its own problems if not encumbered with restrictive legislation.

The latter part of the address is devoted to a discussion of an alleged impending shortage of doctors in Massachusetts with arguments for the adoption of a proposed remedial plan. The premise to the argument is, briefly stated, that since there were 376 retirements from the practice of medicine in Massachusetts in 1938 there should be provided an equal number of replacements, but since graduates from Class A medical schools are not coming here in sufficient numbers to fill these vacancies, the deficiency must, for the present, be made up from graduates of schools that have no approved rating. Under existing conditions the available resource is to be found, chiefly, among the graduates of Middlesex University School of Medicine who are able to pass the requirements of the Board of Registration in Medicine.

In the reference to this school the author of the paper concedes that, as now carried on, it cannot meet the standards adopted by the Committee on Medical Education and Hospitals, and he deplores the fact that Massachusetts has become the "dumping ground" for graduates of unapproved schools. Two questions follow: What are you as members of the Massachusetts Medical Society going to do about it? What is Middlesex University going to do about it?

As for the Massachusetts Medical Society, having accepted for membership 26 graduates of Middlesex (included in the total of 269 admissions), in the year ending June 8, 1939, it has been fair. The only other action by the Society relating to Middlesex concerns various bills on the legislative calendar. If Middlesex shows a determination to meet the requirements for an approved school, the sympathy of the Massachusetts Medical Society will be cordial to the highest degree.

The hope that Middlesex will answer the second question in a proper way is expressed in the implications of the author's statement: "Middlesex University School of Medicine has wonderful opportunities before it, relatively far more, and relatively far more easily attained, than those of Har-

vard, Tufts or Boston University." These "opportunities" briefly abstracted from the paper are a reorganization of the Board of Trustees, better equipment, more teachers, raising the student fees, more clinical instruction and the addition of $30,000 to the annual budget, made possible by an endowment fund raised by the alumni, with increasing amounts in subsequent years as needed.

These suggestions are sound so far as they go. May it not be wise for Middlesex to recognize that the first step in the program should be an appeal to the Council on Medical Education and Hospitals of the American Medical Association and to the Massachusetts Approving Authority, consisting of the secretary of the Board of Registration in Medicine, the commissioner of public health and the commissioner of education, for assistance in this reorganization with the assurance that the advice of the latter organization would be followed? This would mean the elimination of the controlling influence of those with financial interests, if such there be, and the prospect of adequate funds. So far, the attitude of Middlesex toward an advisory body has not been encouraging because it has consistently failed to give all the information requested by the state-approving authorities. As to the financial resources of Middlesex, requests for information at the State House have shown that there are no published statements relating to this subject at the present time.

Examination of the 1939-1940 catalogue of Middlesex University School of Medicine shows that charges to students of medicine for the full four years' course amount to about $1769, which multiplied by 304, the number of students, and divided by 4, gives an annual income of nearly $135,000. If the addition of $30,000 to the budget will advance this school to an approved position in medical education the optimism of the proponent of this plan is justified. Endorsement of the attitude of Middlesex, however, rests on the decision of the approving authorities. One other important question arises, namely the preliminary education of the student body. The wretched showing of the graduates of Middlesex before the Board of Registration in Medicine suggests that their premedical training has not adequately prepared them for the study of medicine. If a brilliant and energetic man succeeds in efforts to bring Middlesex up to an accepted standard, his name will stand on the honor roll of those who have contributed a great deal in the field of medical education.

Returning to the proposition that Massachusetts should have a yearly replacement of the losses to the number of medical practitioners, an approach to the study of this suggestion from a different angle may be in order, even in the face of the impressive and voluminous array of figures and the ingenious argument submitted by Dr. Joslin. According to an estimate recently given by the office of the Secretary of State, Massachusetts has a population of 4,350,000 and the last directory of the American Medical Association contains a record of 7528 physicians in the State. This shows that there is one doctor to about six hundred people, whereas one to a thousand is generally regarded as ample to supply adequate service. Even granted that one fourth of the registered doctors are not engaged in active practice, the proportion is still about one to eight hundred. If statements occasionally heard tending to show that the income of some doctors is not enough to supply the legitimate requirements for the support and education of their families, the enjoyment of the ordinary luxuries and the accumulation of a reserve for old age or misfortune are true, why increase the number of doctors? Other facts indicate that the demand for doctors' services may decline rather than increase because of the improvement in the health of the people and the growing tendency to resort to hospitals where more patients can be treated by a doctor in a given time than is practicable in domiciliary practice.

Taken altogether the general endorsement of the sentiment expressed in the words, "better doctors," rather than "more doctors," indicates a recognition of the way to advance the average quality of medical care and thereby effectively meet the needs of the people. The facts and arguments presented by Dr. Joslin, together with other data and opinions, warrant continued and careful study in order to bring about concerted action which

will be fair to the profession and to the laity. These comments are submitted with the hope that there will be in the near future a symposium on the subjects herein considered.

GRADUATE EDUCATION

THERE can be no question but that the recent growth and development in the art and science of medicine requires that practicing physicians keep abreast of the times. We must all be intellectually fit. In a recent discussion of graduate education in medicine, Abell* calls attention to the increasing need for graduate teaching, which he properly divides into two categories: the one dealing with the preparation and training of specialists, the other concerned with the continued education of those already in active general practice.

This is an age of specialization and the trend in this direction may well have gone too far. Many believe that it has. It seems certain, in any event, that entirely adequate means are already at hand to train, through the medium of postgraduate residencies, men properly equipped with an advanced and detailed knowledge of some particular field in medicine. We need have no fear of the lack of specialists. We may possibly view with some apprehension their increasing number.

The more difficult problem is that of aiding the doctor who earnestly desires to add to his medical knowledge and improve his skill as a general practitioner among his fellow men.

It is often assumed that this burden rests entirely on the shoulders of organized medicine. Abell suggests that intramural courses, consisting of bedside lectures, be given by medical schools and connected hospitals or that demonstrations and clinical expositions covering topics which the physician meets in his daily work be offered under the auspices of the various county societies. The implication appears to be that if such courses are offered, they will be taken to full advantage and with much enthusiasm by the practicing physician, be he urban or rural. This in many instances proves to be the case, as is shown by the attendance at the various postgraduate meetings held throughout the country. Yet in other instances the reverse is unquestionably true. Instructor physicians of note and ability have been prepared in advance for an audience of a hundred or more and been met by the local chairman, three undergraduate students with an eye to adventure and four graduates whose interest was slight and whose attention was nil.

The proper and adequate preparation of a graduate course in medicine — whether it be in the form of didactic lectures or bedside clinics — is at best difficult. No instructor, however experienced, can go forth unprepared and serve up an intellectual menu which is both palatable and nourishing. Time and thought and energy and patience must be expended if graduate instruction is to bear fruit. On the other hand, the physicians for whom the instruction is planned must have a sincere desire to learn and a great willingness to cooperate in any projected program.

The medical profession has, in a sense, assumed a moral obligation to supply opportunities for the acquisition of further knowledge to those who seek it. Let it shoulder this obligation squarely and sanely. But the practicing physician who would take advantage of this graduate education in medicine — be he old or be he young — must likewise do his share or the seed falls on barren ground. The obligation to teach is no greater than the necessity of keeping intellectually fit.

*Abell, I.: The aims of the medical profession as they relate to the public. J. A. M. A. **110**:2041-2044, 1938.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY*

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ACUTE INVERSION OF THE UTERUS ASSOCIATED WITH PLACENTA ACCRETA

Mrs. M. D., a twenty-six-year-old para II, was delivered at home on February 23, 1927, and transferred to the hospital because after five hours the placenta had not been delivered.

*A series of selected case histories by members of the section will be published weekly. Comments and questions by subscribers are solicited and will be discussed by members of the section.

The family history was negative, as was the past history. Catamenia began at thirteen, were regular with a twenty-eight-day cycle and lasted four days without pain. Her previous pregnancy had resulted in a normal delivery in 1926. Her last period was May 8, 1926, making the expected date of confinement February 15. The prenatal course had been normal.

Following delivery at home, the patient's pulse was 130. On entry it was 145. The blood pressure was practically unobtainable. The patient was crossmatched with her husband for possible transfusion and the husband was found to be compatible. Manipulation of the uterus and the injection of posterior pituitary extract did not result in the delivery of the placenta, consequently the uterus was invaded. Under nitrous oxide and oxygen anesthesia and strict asepsis the cervix was found readily dilatable; the placenta was attached to the left anterolateral wall of the uterus. A line of cleavage was found, and the placenta slowly separated. As it was withdrawn from the birth canal, the fundus immediately followed. Pieces of placental tissue and membrane were still attached to the fundus; these were removed with gauze and a curet. The fundus was readily replaced in the abdominal cavity and was packed with six yards of sterile gauze. At the end of the operation the patient was in deep shock, the blood pressure barely obtainable, and the pulse rapid and just perceptible. Three hundred and fifty cubic centimeters of citrated blood from her husband was given, and within a very short time the blood pressure was 90 systolic, 60 diastolic, and the pulse came down to 120. The uterine pack was removed the following day, and there was no further bleeding. No blood studies were made. The patient had an uneventful convalescence. A pathological examination disclosed a placenta accreta.

Comment. This is a very interesting combination — a partial placenta accreta and acute inversion of the uterus. Furthermore it shows that partial accretas may be treated without hysterectomy. It is quite remarkable too that the trauma associated with the removal of the placenta and the curettage of the exposed placental sinuses followed by gauze packing did not result in infection. The value of transfusion is again emphasized.

This inversion was undoubtedly closely associated with the accreta. The removal of the placenta, part of which was firmly adherent to the uterine wall, caused the uterus to turn inside out as the placenta was being delivered.

MISCELLANY

TUBERCULOSIS CASE-FINDING IN PUBLIC SCHOOLS

An advisory committee on tuberculosis of the Medical Society of New Jersey has drafted a statement of principles and standards regarding tuberculosis case-finding among pupils in public schools. This carefully drafted statement (Tuberculosis Case-Finding in Public Schools. J. M. Soc. New Jersey 36:109–111, 1939), representing the views of one organized body of physicians, should be helpful to all physicians, as the practice of case-finding in schools is growing in popularity. Space prohibits reprinting the report in full — some passages have been abbreviated, others omitted.

1. QUESTION. How valid is the tuberculin test? May we assure parents that the positive or the negative reaction is absolutely correct?

ANSWER. The tuberculin test is one of the most reliable tests that we have for determining whether or not tubercle bacilli have at some time entered the body. If positive, it does not necessarily indicate the presence of tuberculosis, the degree of infection, or the extent of damage done, if any.

For all practical purposes, exceptions to this statement may be ignored. They should not cause worry to parents.

2. QUESTION. Which grades should be tested?

ANSWER. The ideal plan would be to test children of all grades and ages.

First Grade Pupils. In this group one is likely to find so small a number of infections as hardly to make the effort worth while on a very large scale. On the other hand, experience has shown that very young children with positive tuberculin reactions will serve as leads to a large number of open cases of tuberculosis that are active sources of infection.

Kindergarten. The same may be said of this group.

High School. The high-school age is receiving special attention for several reasons. First, because of the high morbidity and mortality rate known to exist between the ages of fifteen and twenty-five. Secondly, because in the average high school a large percentage of this important age group is available under ideally controlled conditions. More cases of tuberculous infections are likely to be found in this age than in the lower grades.

3. QUESTION. When is re-testing advisable?

ANSWER. All tuberculin-negative students should be retested at least once a year. All tuberculin-positive students should be re-x-rayed at least once a year, unless something abnormal is found, when the frequency of re-x-raying will depend upon the particular circumstances in each case.

4. QUESTION. Is the Mantoux test so definitely superior to other tests that the question of choice may be ignored?

ANSWER. The Mantoux test is definitely superior to other tests because: it is twice as sensitive as the scratch test of von Pirquet; it is an exact quantitative test; the response when positive is more definite and more prompt than it is in all other tests.

However, as a second choice, especially in the face of objection to the "needle," the patch test may be used. The following are the objections to the patch test: it must be kept dry; it must not be interfered with by the child;

frequently when examined at the end of forty-eight hours, it may be negative, and require four days for a reading; under the best of circumstances it is at least 5 per cent less reliable than the Mantoux test; the greater cost of each test would also become a financial problem if planned for a large number.

5. QUESTION. What is the significance of different degrees of reaction?

ANSWER. Different degrees of reaction have no significance beyond the fact that they indicate different degrees of sensitivity. This has no bearing on the question of the amount of infection or disease, and need not concern school administrators or even school physicians. It it better not to confuse the minds of parents with any attempts to interpret degrees of reaction.

6. QUESTION. Should all positive reactors be x-rayed? Are there indications to warrant x-raying of negative reactors?

ANSWER. All positive reactors should, without exception, be x-rayed.

With reference to negative reactors, an x-ray is not necessary to exclude tuberculosis; but it is frequently advisable for certain special reasons, such as malnutrition, suspicion of heart disease, chest deformity, or recent non-tuberculous lung infections such as pneumonia, or the presence of symptoms of chronic bronchitis or pulmonary disease of non-tuberculous character.

7. QUESTION. Is paper x-ray film accurate?

ANSWER. Although paper films have certain limitations, they are quite satisfactory in the "sifting" process or screening out of abnormalities.

8. QUESTION. Is the celluloid film infallible?

ANSWER. No. There are lesions in the lung so small and so translucent to the ray that they may not be demonstrable in any films.

9. QUESTION. Assuming a positive reaction to the Mantoux test, and a negative reading of a paper film, what should be told parents?

ANSWER. A positive Mantoux reaction, by itself, does not indicate that a person has tuberculosis. "If the tuberculin test is positive (red and swollen), it means only that tuberculosis germs have at some time entered the body. It does not tell how many there are, or if any damage has been done. It should not cause worry to parents.

"If the test is positive, the child's chest should be x-rayed to be certain that no harm is being done in the lungs. An x-ray examination should also be made of every member of the household to learn if the child is being exposed to an open case of tuberculosis. Frequently this may reveal other cases of tuberculosis before the victim is at all aware of the disease. If no one in the family has the disease, search should be made among the child's playmates or others with whom he comes in close contact. It is perfectly safe for a child with a positive reaction to mingle with other children — for unless there are tubercle bacilli in his sputum, he cannot pass them to others. Tuberculosis often exists in a concealed form in unsuspecting persons, and it is important to make the discovery in order to prevent further spread of the disease."

The parents should also be advised that the tuberculin-positive student should be x-rayed regularly at least once a year so as to detect any evidence of reinfection as early as possible. If the tuberculin test is negative, no x-rays are necessary until a subsequent tuberculin test proves to be positive.

10. QUESTION. Will you outline briefly the follow-up procedure for the average school district?

ANSWER. After a tuberculosis survey, the parents are advised in a general way as to the results, and instructed to see their family physician for further explanation of the same.

Parents receiving reports to the effect that the Mantoux test was negative are advised of the importance of having the children re-tested annually by their own doctor, as long as they are negative.

In the case of the child who had a positive Mantoux with a negative x-ray, the parents are advised to have the child x-rayed at least once a year thereafter through their own physician. They are also advised to have all other members of the household x-rayed, and all children under fifteen Mantoux tested.

In the case of those children in whom the x-ray showed some abnormality, the parents are particularly urged to take the report of the findings to their family physician at once. He is to be further informed of the desirability of communicating personally with those conducting the survey, who should endeavor to co-operate with him to the fullest extent on behalf of his patient. For those who cannot afford private service, the facilities of the tuberculosis clinics should be made available.

With reference to the schools, plans are formulated for continuing these surveys so as to test all new admissions each spring, as well as those previously tuberculin negative.

It is advised that no child should be excluded from school until x-ray study reveals findings that would warrant it and no type of active case, communicable or not, should remain in school — all active cases require treatment. — Reprinted from *Tuberculosis Abstracts* (July, 1939.)

NOTES

Sir Thomas Lewis, physician to the University College Hospital, London, England, has been appointed to the annual Edward K. Dunham Lectureship for the Promotion of the Medical Sciences in the Harvard Medical School for the coming academic year, the university recently announced. Sir Thomas is one of the world's leading authorities on diseases of the heart. The lectureship is intended "to bind closer the bonds of fellowship and understanding between students and investigators in this and foreign countries." The lecturers are drawn chiefly from among the leaders of foreign medical research by a committee at the Harvard Medical School.

Middlesex University School of Medicine announces the appointment of Dr. Theodore Fischer-Galati as professor of ophthalmology. Born in Roumania, Dr. Fischer-Galati received his medical degree from the University of Vienna and then studied at the University of Rome. He eventually became a member of the medical faculty of the University of Rome, serving from 1929 to 1938 as professor of ophthalmology. On his return to Roumania he was decorated for his scientific accomplishments and was made chief of the ophthalmological service at the Polyclinic Hospital of Bucharest. For the past few months, Dr. Fischer-Galati has been engaged in research under the sponsorship of the Mexican government.

NOTICES

REMOVALS

JOHN DENOVIAN, M.D., announces the removal of his office from 35 Poplar Street, Belmont, to 16 Trapelo Road, Belmont.

SAMUEL H. EPSTEIN, M.D., announces the removal of his office from 475 Commonwealth Avenue to 370 Commonwealth Avenue, Boston.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JULY 24

TUESDAY, JULY 25

*10 a. m. - 12:30 p. m. Boston Dispensary tumor clinic.

FRIDAY, JULY 28

*10 a. m. - 12:30 p. m. Boston Dispensary tumor clinic.

SATURDAY, JULY 29

*10 a. m. - 12 m. Staff rounds of the Peter Bent Brigham Hospital. Conducted by Dr. Marshall N. Fulton.

*Open to the medical profession.

AUGUST 30 - SEPTEMBER 2 — Seminar in Physical Therapy. Page 857, issue of May 18.

SEPTEMBER — Boston Psychoanalytic Institute. Page 450, issue of September 22, 1938.

SEPTEMBER 4-6 — Institute for the Consideration of the Blood and Blood-Forming Organs. Page 941, issue of June 1.

SEPTEMBER 5-8 — American Congress of Physical Therapy. Page 857, issue of May 18.

SEPTEMBER 11-15 — American Congress on Obstetrics and Gynecology. Page 938, issue of December 8.

SEPTEMBER 14-16 — Biological Photographic Association. Page 941, issue of June 1.

SEPTEMBER 15-28 — Pan-Pacific Surgical Association. Page 863, issue of November 24.

OCTOBER 23 - NOVEMBER 3 — New York Academy of Medicine. Page 977, issue of June 8.

FALL, 1939 — Temperature Symposium. Page 218, issue of February 2.

DECEMBER 2 — American Board of Obstetrics and Gynecology. Page 1019, issue of June 15.

MAY 14, 1940 — Pharmacopoeial Convention. Page 894, issue of May 25.

JUNE 7, 8 and 9, 1940 — American Board of Obstetrics and Gynecology. Page 1019, issue of June 15.

BOOK REVIEWS

The Wisdom of the Body. Walter B. Cannon. 333 pp. New York: W. W. Norton & Co., Inc., 1939. $3.50.

The entire medical profession and many non-professional groups will have added reason to be grateful to Professor Walter B. Cannon for the appearance of a second revised and enlarged edition of *The Wisdom of the Body*. During the seven years since the first edition, additional researches have brought forth new facts and developments in the realm of bodily stabilization which have been incorporated in this new edition. Also, a new chapter has been added on the effects of age on homeostatic mechanisms.

The purpose of the book, as stated by the author in the introduction, is "to consider, first, what may be regarded as the fundamental condition of stability, then the various physiological arrangements which serve to restore the normal state when it has been disturbed, and finally, the narrowing limits of adaptation imposed by age." The development of these thoughts brings new meaning to the Hippocratic concept of the *vis medicatrix naturae*, to Claude Bernard's *milieu interne* and to Cannon's *equilibria* and *homeostasis*.

The wisdom of the body is defended by presenting the reader with an inductive unfolding of the methods employed in preserving the homeostasis of blood sugar, of blood proteins, of blood fat, of blood calcium and of neutrality in the blood. Evidence is further gathered by a consideration of the constancy of the water and salt content of the blood; the maintenance of the constancy of body temperature; thirst and hunger as means of assuring supplies; the maintenance of an adequate oxygen supply. Other chapters are titled: "Natural Defenses of the Organism," "The General Functions of the Nervous System," "The Role of the Sympatho-Adrenal System in Homeostasis," "The General Features of Bodily Stabilization" and "The Relations of Biological and Social Homeostasis." The bibliography consists of a list of publications from the Physiological Laboratory of Harvard University, on which the present account is based.

The critical reader will be stimulated by the questions which Professor Cannon raises as problems for future investigation. The following examples may be cited. On page 75, one reads: "The explanation, therefore, of this peculiar behavior of the stomach, which originates the pangs of hunger, remains to be discovered." Again, on page 87, it is stated: "Just how water is released from storage as it is needed to keep constant the state of the blood is not as yet fully explained — indeed, the same statement may be made regarding its deposit in the reservoirs and its retention there." On page 181 the author writes: "For the present the control of the internal secretion of the thyroid must be left for further research." Finally, in discussing the regulation of supplies of both protein and fat, we read: "The importance of securing further knowledge of the ways in which the primary substances are laid by and later mobilized for use is unquestioned. But for such knowledge we must await the progress of patient research."

This book excels in clarity of expression, in easy readableness and in strict adherence to fact, for which reasons it will continue to be regarded as a necessary addition to every library, lay or professional.

Handbook of Practical Bacteriology: A guide to bacteriological laboratory work. T. J. Mackie and J. E. McCartney. Fifth edition. 586 pp. Baltimore: William Wood & Co., 1938. $4.00.

This compendium of the fundamental data of bacteriological and immunological knowledge in so far as it relates to organisms causing disease has been published in five editions within a period of fourteen years. This is clear evidence that the book fills a definite need on the part of a fairly large group. Since only the elements are presented and these in the most succinct manner possible, this group in all probability is composed largely of novitiates and those, such as technicians, who may require a simple and perspicuous account of the manner in which the most important parasitic agents of man may be identified and studied in the laboratory.

The book is divided into three principal parts. The first deals with the classification and physiology of microorganisms and the principles of immunology in so far as they have a practical application. Then follow chapters which present tersely, but with sufficient specific detail to make all the procedures clear and thus easily to be carried out in the laboratory by the beginner, specific instruction in such essential matters as the preparation of the standard varieties of culture media for bacteria, the technics of animal experimentation as related to the study of living pathogenic bacteria, the details of practical im-

munological and serological tests commonly used in diagnosis, and finally an exposition of the methods employed in the bacteriological study of milk and water, testing of antiseptics and other useful matter of a similar nature. The third section compresses in a surprisingly small space the most important data concerning the majority of bacteria pathogenic for man by which they may be quickly recognized and upon which specific methods of prophylaxis and therapy are based. Included here as well are brief accounts of some of the pathogenic fungi and protozoa, together with a chapter on the filterable viruses.

In the opinion of this reviewer the authors have been unusually successful in their intent to present a simple and accurate outline of practical bacteriology. Particularly to be recommended is the section on culture media to which the authors have given considerable space. The exclusion of all but a handful of references to the literature is to be regretted, but it is obvious that recently reported advances pertinent to the subject have been incorporated.

The Journals of Bronson Alcott. Selected and edited by Odell Shepard. 558 pp. Boston: Little, Brown & Co., 1938. $5.00.

Most of Bronson Alcott's contemporaries seem to have regarded him as a "man ineffectually good, mild, vague and somewhat absurd," and most critics since, largely accepting this verdict, have been willing to allow his name to pass into oblivion. Yet directly or indirectly Alcott was not without a considerable influence in his day. Emerson valued his friendship and opinions, called him, indeed, "the most extraordinary man and the highest genius of the time." Thoreau said he was "the sanest man" he had ever known, and Hawthorne, Frederick Hedge, and William T. Harris all ranked him high among philosophers. More than any other man "he spread the 'culture' of New England in the new Middle West," and he was the "one complete representative of American transcendentalism."

The writings of a man who touched upon life at so many points must of necessity be of interest to students and historians, and they must be grateful to Shepard for these well-selected extracts from voluminous and hitherto unpublished journals. The casual reader, on the other hand, is not likely to be much intrigued. Alcott never intended these writings for publication, and truth to tell, he did not write so well as perhaps he ought to have written. For general interest Alcott's own remarks do not compare with Shepard's comments about him. Indeed, Shepard writes beautifully, as witness his life of Alcott, *Pedlar's Progress,* the Pulitzer prize winner for 1938. One who purposes to read these journals would do well to read the biography first: that is what your reviewer did.

If one were to be asked what especial interest Alcott's journals have for the medical man, the answer would be, "None." There is an occasional mention of this or that medical author whose writings Alcott had read or tried to read, but he did not have the scientific eye; he read only for what he might appropriate to metaphysics. If the physician, not as a doctor but as a man, happens to be fond of history and happens as well to love a beautifully made book, there is something here for him.

Superfluous Hair and Its Removal. A. F. Niemoeller. 155 pp. New York: Harvest House, 1938. $2.00.

"Superfluous hair" is not likely to appear in a death certificate as the immediate cause of death. Nor is it apt to cause physical pain or obvious disability; however, depending upon its character, size, color and distribution it may become a serious handicap to the individual who is so afflicted. Thus, the author introduces the problem. He claims no definite knowledge of the etiology, but is inclined to believe that it may result from some disturbance in the endocrine system.

As regards treatment or the methods of removing superfluous hair, he sets up three standards: safety, painlessness and permanence. In the light of these standards he analyzes the popular methods and points out the weaknesses in each.

Concerning the various chemicals or lotions there is the following general statement: "There is no known drug, paste, lotion or application of any sort that may be applied to the skin and affect a permanent removal of hair." X-ray and radium therapy he treats with strong condemnation. Electrolysis seems to be his method of choice, and he devotes some fifteen pages to it. (The reviewer doubts the advisability of using the multiple needle method.) Surgical diathermy runs a close second and is given considerable attention. Shaving gives no permanent relief but as a rule is a safe method, and because of its general use, particularly by men under normal circumstances, his discussion of this subject is of interest. Abrasives, bleaching, tweezing and other less important methods are also discussed.

This is claimed to be the first book on the subject, and its author may be congratulated on making a valuable contribution.

Personal and Community Health. C. E. Turner. Fifth edition. 652 pp. St. Louis: C. V. Mosby Co., 1939. $3.00.

The proper presentation of hygiene and public health to the college student offers considerable difficulty. The average student is not particularly interested in many aspects of the problem, and it is extremely easy to give undue weight to certain phases and omit or curtail others. Professor Turner has compiled a book for college students that avoids these pitfalls. He covers a large field in a comparatively short presentation of well-chosen words. The book is sound, and the fact that it has gone through five editions and is the standard textbook for a large number of colleges testifies to its worth. Anybody desirous of getting a bird's-eye view of a subject that needs volumes for detailed explanation will do well to read this book.

The references at the end of each chapter are particularly helpful for those wishing to do more extensive reading.

Schafer's Essentials of Histology: Descriptive and practical for the use of students. H. M. Carleton. 618 pp. Philadelphia: Lea & Febiger, 1938. $5.00.

The present edition, which is edited by H. W. Carleton, carries on the tradition of a good textbook. The general character of the book, as originally prepared by Sharpey Schafer, has been retained yet the text has been admirably brought up to date. The physiological point of view is adequately considered. An important innovation is the use of photographs without any reduction in size in order to obtain the maximum of detail. Reading this book is like meeting an old friend, and it is highly recommended to students and practitioners as an excellent, practical statement and exposition of the microscopic structure of the body.